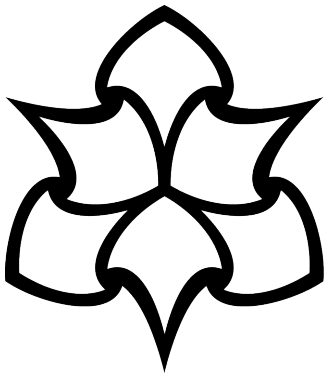

An Exploration of Stakeholder Perspectives on Primary School Food Provision in Medina, Saudi Arabia

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Table of Contents

List of Tables

List of Figures

Abstract

Childhood obesity currently represents a major public health challenge in Saudi Arabia (KSA), prompting calls for research into contributory factors. This study examines how the current system of school food provision (SFP) in Saudi state primary schools relates to KSA's broader nutrition environment, in order to inform future policy and practice in SFP. It focuses principally on the perspectives of two stakeholder groups, parents and teachers from Medina, KSA, adopting a mixed-method approach using questionnaires, focus groups and interviews to gauge opinions on current SFP for 6-12 year-olds, explore attitudes towards implementing change and identify factors likely to facilitate or hinder this.

Questionnaire results from a sample of parents (n=295) and teachers (n=77) highlighted the importance of SFP in the nutrition environment of 6-12 year-olds and indicated broad support for changing current provision. Results also suggested that family finances, school facilities and funding models merited careful consideration when designing new SFP. Focus group data analysis identified other factors likely to facilitate or hinder changes to SFP while interviews with officials provided insights into how SFP related to the broader socio-cultural, economic, regulatory and legislative context in KSA.

Findings were synthesised with evidence from existing literature to produce a socio-ecological model of KSA's nutrition contexts, illustrating the broader influences on food behaviours of 6-12 year-olds in the school environment. Enablers/barriers to implementation of healthier SFP in KSA were also identified. Recommendations emphasised the importance of adopting a whole school approach to SFP to ensure this is more likely to address childhood obesity concerns, by creating curriculum links to health, nutrition and physical activity, engaging stakeholders and improving food quality and facilities. They also highlighted the need for connectedness in government policy/strategy, accountability/transparency in the regulatory context and a new financial model for SFP.

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1 Chapter One: Introduction

1.1 Overview of the chapter

This chapter presents an introduction to this research. After establishing the scope and significance of this research, it explains why studies of this kind are valuable and urgently needed in societies undergoing a nutrition transition like the Kingdom of Saudi Arabia (KSA). After providing this rationale, the aim and objectives of the research are presented, followed by the research questions that this study addresses. The chapter ends with an overview of the contents of this thesis.

1.2 Scope of the research

This research investigates the role that school food provision in state primary schools plays in the nutrition environment (Glanz et al., 2005) in KSA, by conducting a study in Medina, a large Saudi city. It gauges the opinions of parents and teachers towards this provision and their attitudes concerning the desirability and viability of replacing this with an alternative system for feeding children in state primary schools. By synthesising data gathered from surveys, interviews and focus groups conducted with stakeholder groups, this research identifies the factors that are likely to facilitate or hinder implementation of changes to school food provision in KSA and discusses how these relate to the broader nutrition environment, considering the implications for policy.

Where useful, this research draws on evidence and insights from research and case studies regarding school food provision from both the western world and developing countries, comparing and contrasting these with findings from this study and using them to identify best practice that would be applicable in KSA.

1.3 Significance of the research

As the review of existing literature demonstrates (Chapter Three), numerous studies have focused on the increasing levels of childhood obesity and related health problems in KSA. Many have concluded that the diet of Saudi children and adolescents is one of a number of factors thought to be contributing to this. Some have identified the current system of school food provision in the state sector as playing an important role. A much smaller number of studies have documented the results of interventions in this area.

The importance of adopting a more holistic approach to school food provision has been highlighted in research and case studies examining school food initiatives intended to improve children's health in both western and developing countries. They point to the usefulness of employing social ecological models when implementing school food initiatives and of considering the wider school context. Guidelines based on findings from previous studies also emphasise the need to give a voice to stakeholders such as parents and teachers and engage them in these initiatives to ensure they have a greater chance of success.

This research represents the first study to provide a detailed evaluation of the part that school food provision plays within the broader nutrition environment of KSA and consider the range of factors that are likely to facilitate or hinder implementation of changes to school food provision in KSA. It is also the first to attempt to gauge stakeholder opinions to the current system of provision or explore attitudes towards possible changes to provision. It therefore makes an innovative and valuable contribution not only to studies relating to children's health in the Saudi context but its findings will also be of wider interest to public health researchers in other societies undergoing a nutrition transition, particularly those in the Arab world.

1.4 Rationale for the research

Obesity in Saudi children now exists in all regions of KSA, whether rural or urban, and has been linked most frequently with unhealthy dietary habits, sedentary behaviours and physical inactivity (Al-Dossary et al., 2010: 1003). One study of 6-14 year-old boys in Riyadhi primary schools found that in the space of less than two decades, the percentage of obesity in this age group had increased from 3.4% to 24.5% (Al-Hazzaa and Al-Rasheed, 2007). Given that KSA, like many of the Gulf States, is a prominently young society in demographic terms (see Chapter Two) statistical trends of this kind have been seen as representing a 'ticking time bomb' (Popkin et al., 2012: 3) for public health.

A number of studies have concluded that the current system of school food provision in the state sector is one of a range of factors contributing to the growing incidence of childhood obesity and related health problems in KSA (see Chapter Three Literature Review). Given that school-age children constitute approximately 20% of the Saudi population and that the vast majority of these

five million pupils attend state schools (Jiffry, 2014), there have been calls for public health policies designed to provide healthier food choices for schoolchildren (see, for example, Farghaly et al., 2007). Government initiatives in this area suggest that transforming school food provision is on the policy agenda. However, socio-ecological models of public health suggest that initiatives of this type are unlikely to have any significant impact on children's health unless careful thought has been given to how they relate to the broader food environment.

Glanz et al. (2005: 330) note that "In the context of an obesity epidemic, it is essential to improve our understanding of food environments as rapidly as possible". Socio-ecological models of public health, like their model of nutrition environments, can help us to understand how government policy concerning school food can be translated into initiatives, legislation, regulation and guidelines and relates to the broader nutrition environment. They can also provide insights into why government public health policy relating to school food is more likely to be successful when it is based on an attempt to understand the wide range of variables that influence children's food choices, including their personal experiences, the behaviour of their peers, the attitudes, values and perceptions of family and teachers, and the school's built environment, to name but a few.

This study attempts to understand how the current system of school food provision in Saudi state primary schools relates to the nutrition environment of KSA, paying particular attention to the role of two key stakeholder groups within that environment: parents and teachers. It then uses this knowledge to identify factors that are likely to facilitate or hinder implementation of policies related to healthier school food provision in KSA and considers the implications of this for policy and practice.

1.5 Research aim and objectives

The aim of this research is to understand how the current system of school food provision in Saudi state primary schools relates to the nutrition environment of KSA and consider the implications of this for policy and practice.

This broad aim will be achieved by fulfilling four specific objectives:

1. To explore the role that school food currently plays in the nutrition environment of 6-12 year-olds in KSA.
2. To gauge parents' and teachers' attitudes towards the current system of school food provision offered in state primary schools in KSA.
3. To explore parents' and teachers' perceptions concerning the desirability of changing the current system of school food provision in these schools and the extent to which they think this is viable.
4. To determine the factors that are likely to facilitate or hinder implementation of policies related to healthier school food provision in the nutrition environment of KSA and consider the implications of these findings for policy and practice.

1.6 Research questions

1. What role does school food currently play in the nutrition environment of 6-12 year-olds in KSA?
2. What do parents and teachers see as the strengths and weaknesses of the current system of school food provision offered in state primary schools in KSA?
3. What are the perceptions of these stakeholder groups with regard to the desirability and viability of changing this provision?
4. Which factors are likely to facilitate or hinder implementation of policies related to healthier school food provision in the nutrition environment of KSA and what are the implications of these findings for policy and practice?

1.7 Outline of the thesis

Chapter One describes the scope and significance of this research and provides a rationale for this study. After presenting the aim and objectives of the research and the questions that it addresses, the chapter outlines the contents of the thesis.

Chapter Two contextualises this study by describing the nutrition environment within which the current system of primary school food provision in the state education sector in KSA is situated. After providing details about the KSA and the city of Medina which is the setting for this study, it examines some of the

factors which influence how the Saudi education system has developed over time and how it currently operates at the national and the local level. It examines how the role which food plays within Saudi society in general and within the school system in particular has been shaped by economics, Islamic beliefs, Arab sociocultural traditions, and the natural environment of the Arabian Peninsula. These multiple environments help to condition what groups and individuals within that system think about food, and the preferences, attitudes and perceptions that affect their food choices.

Chapter Three critically reviews existing literature on childhood obesity in KSA, the issue which originally motivated this study. It begins by establishing the scope of the childhood obesity crisis in KSA and the reasons why this has become a major public health concern. It explores the risk factors and lifestyle characteristics within the Saudi nutrition environment which are believed to have contributed to its growth and the extent to which these factors differ from or are similar to those found in both the Western world and in other Arab countries. It concludes by indicating the existing gap in research in this field.

Chapter Four presents the research methodology, design and approach used for this study. It explains in detail the data collection techniques used to achieve the aim and objectives of the research and provides the rationale for their use. After describing the conceptual framework, and the research philosophy, this chapter goes on to describe the approach taken in the research. Following this, it details the mixed methods research design, which includes both qualitative and quantitative data collection methods. Other aspects considered include reliability and validity of the data collection, and ethical considerations of the research.

Chapter Five presents the statistical results of the two questionnaires used to survey a sample of parents with children attending state primary schools in Medina, and male and female primary school teachers based in the same Saudi city.

Chapter Six provides the results of the thematic analysis of the focus groups and interviews that were used to gather opinions from a sample of parents and teachers from schools in Medina and from officials from the Saudi Ministry of Education concerning the current school food system in KSA.

Chapter Seven synthesises the findings from quantitative data (parent and teacher questionnaires) and qualitative data (interviews and focus groups) with observations made on school visits, official documentation and existing literature regarding young schoolchildren and the factors that influence their nutritional health in the school food context. These findings are used to produce a socio-ecological model of KSA's nutrition contexts, illustrating the broader influences on food behaviours of 6-12 year-olds in the school environment. Enablers/barriers to implementation of healthier SFP in KSA are also identified and finally the limitations of this study are also considered.

Chapter Eight summarises the findings of the research and drawing on the implications of these findings for policy and practice, provides a series recommendations. It also discusses future directions of research and highlights the contribution that this study makes to current knowledge.

2 Chapter Two: School Food Provision and the Nutrition Environments of Saudi Arabia

2.1 Introduction

This chapter contextualises the study of the provision of school food for 6-12 year olds in the state education sector in the city of Medina in KSA that forms the core of this research. It draws on the concept of nutrition environments (Glanz et al., 2005). Glanz et al. maintain that public health policy intended to improve nutritional standards must consider the complex set of variables that shape individual food choices and eating patterns. They argue that greater priority needs to be given to understanding this.

Based on this premise, it is argued here that any government-backed initiatives to improve the health of Saudi primary school children by making changes to the current system of school food provision are unlikely to be effective unless a concerted attempt is made to understand these interconnections and how they relate to each other within the particular nutrition environment of KSA. Therefore, this chapter uses Glanz et al.'s (2005) model as a starting point to explore some of the key aspects of the nutritional contexts that influence the setting for this study. The following chapter considers how the transformations that have occurred within these environments have impacted on eating behaviours and food choices within KSA and led to the country's current childhood obesity crisis.

The socio-ecological model proposed by Glanz et al. (2005) envisages three sets of variables affecting patterns of eating behaviour (see Figure 2.1). The first of these are policy variables relating to government and industry policy. Next, they identify four different types of environmental variables. They categorise three of these as nutrition environments covering community-level access to food, organizations (including home and school) and the consumer. A fourth environment, the information environment, covers media and advertising. Like the other three nutrition environments this is affected by both government and industry policies (for example, regulation and Codes of Practice) but it can also influence the other environments by shaping attitudes towards foods and public understanding of debates about food-related issues. All of these environmental variables also contribute to the creation of the perceived nutrition

environment. This can be described as the perceptions of the availability and/or accessibility and/or affordability of healthy and unhealthy foods that shape our individual food choices (Belon et al., 2016).

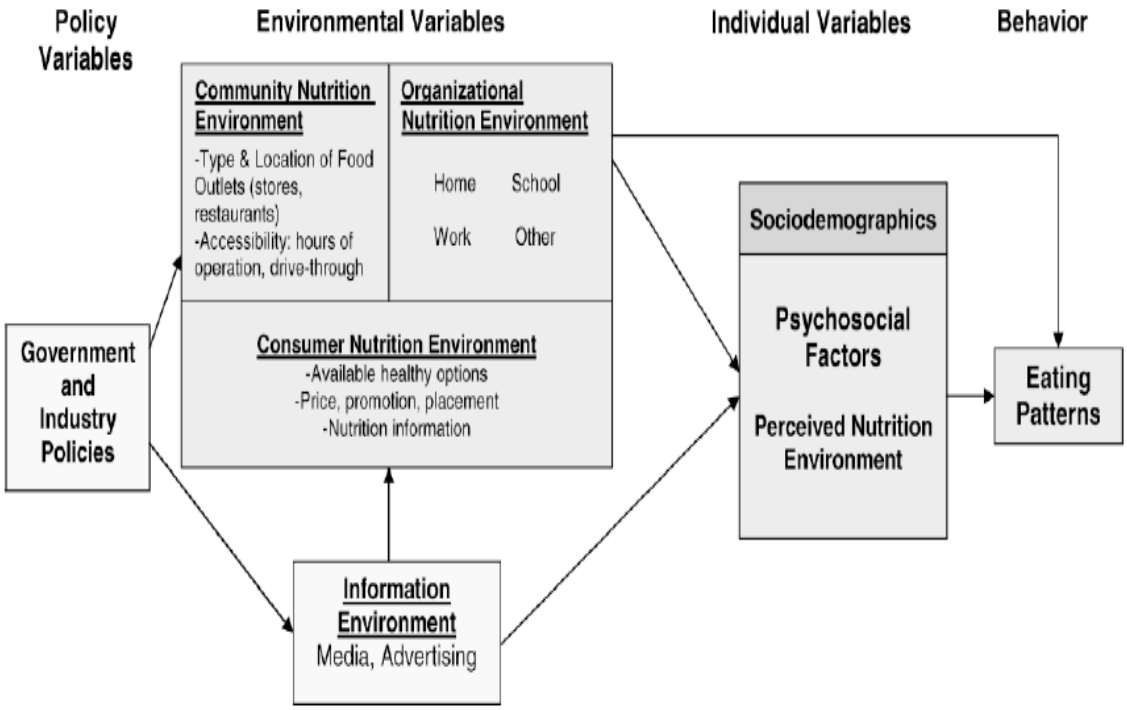

Figure 2.1: Model of nutrition environments (Glanz et al., 2005)

It is worth noting that Glanz et al. (2005) developed their model within a western democratic setting and it is suggested here that to understand the nutrition environment of an Islamic theocracy like KSA it is necessary to make one small but very significant adjustment to this model as shown in Figure 2.2.

Islam has deliberately been represented as encompassing all the elements of the model since for Muslims, their religious beliefs shape and permeate every aspect of their lives. In KSA this influence extends from government policy and the legal framework within which it operates (the principles of Islamic law or *Shari'a*) to the personal context, since individual food choices and eating patterns for a practising Muslim are governed, for example, by the concept of *halal* and of fasting during Ramadan. The next section provides the context for this study which is followed by a more detailed discussion of what is referred to here as the Islamic nutrition environment.

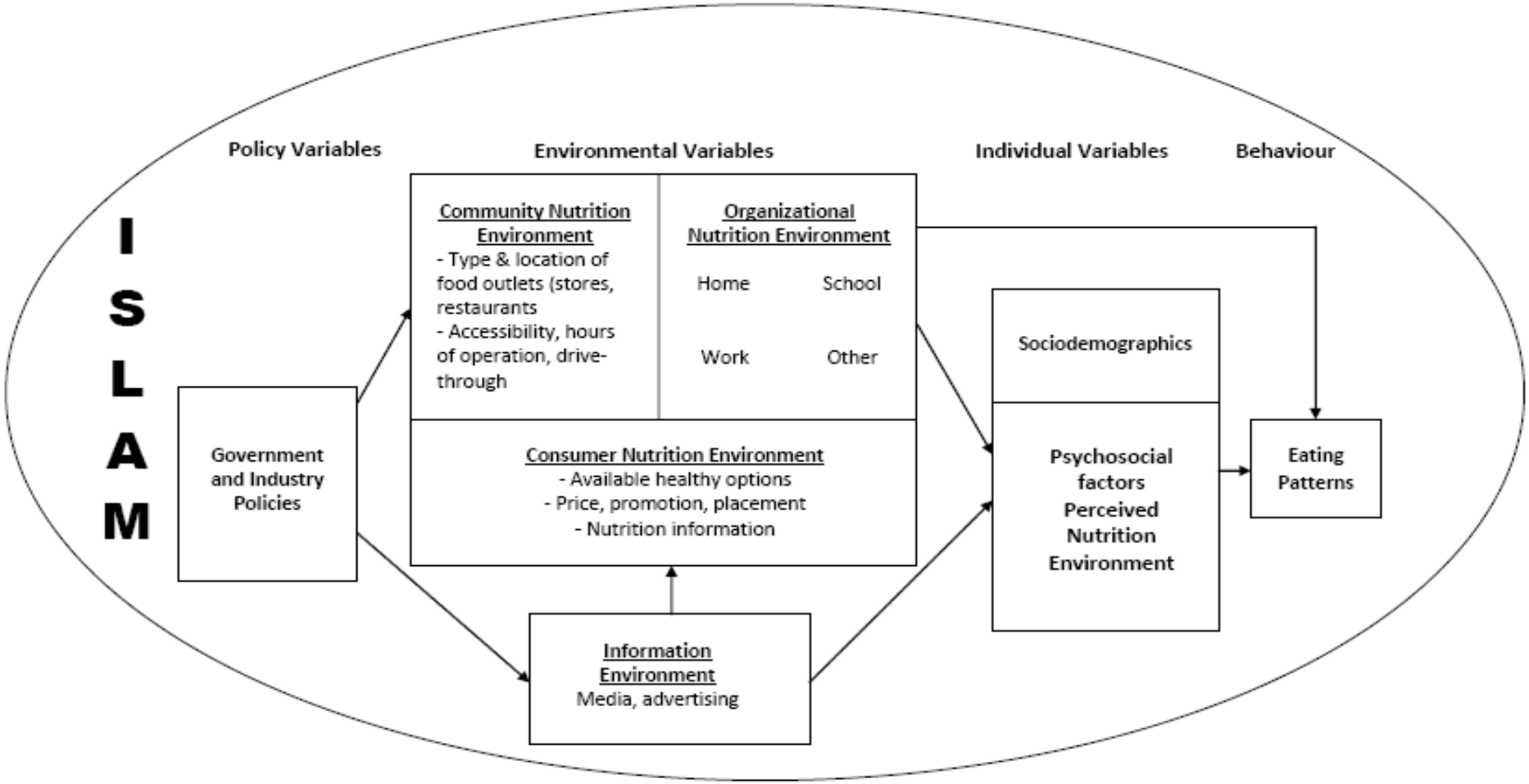

Figure 2.2: Glanz et al.'s (2005) model of nutrition environments adapted for the Saudi context

2.2 Saudi Arabia: A kingdom of change and continuity

2.2.1 Economic change

The modern Kingdom of Saudi Arabia (KSA) is a large Islamic, Arabic-speaking country that dominates the Arabian Peninsula. Since oil was discovered there in 1937 KSA has become the world's largest producer and exporter of this natural resource and it possesses some 20 per cent of the planet's reserves of this fossil fuel (Rasheed, 2010). The revenues generated by oil exports have been used to transform KSA, building an infrastructure, creating major urban conurbations and improving the lives of its citizens with public services. Once a Bedouin and largely rural society, KSA is now a modern state with a rapidly expanding population that numbered just 7 million in 1974 but is now estimated to be 28 million and is expected to reach 60 million by mid-century (World Population Review, 2016).

Figure 2.3: Kingdom of Saudi Arabia (Source: www.globalsecurity.org)

The growth is attributed to immigration. Attracted by wealth and prosperity, economic migrants travel to KSA for employment. Consequently, the Saudi population is diverse, with many workers coming from neighbouring Middle Eastern countries and from South-East Asia, largely Palestinians, Yemenis, Egyptians, Pakistanis and Indians. More recently, these have been joined by arrivals from the Philippines Thailand, and South Korea (Bel-Air, 2014). Oil interests have also meant a small but significant presence of expatriate

westerners working in the hydrocarbon sector, particularly Americans and British (Bel-Air, 2014).

Although these migrant workers can be found in many different sectors, the majority are unskilled, and are employed in construction, agriculture and domestic service. Since Saudi workers are typically unwilling to undertake the type of menial tasks required in these industries, the economy of KSA is heavily dependent on this migrant labour, and a 2014 report estimated the total of foreign workers in KSA as at least 5.6 million (Bel-Air, 2014).[1] This demographic diversity is also reflected in the classrooms of KSA's urban state schools as many members of these migrant communities have now become settled in the large cities and raised families there.

2.2.2 Technological change

In the decade following the First Gulf War, KSA experienced massive technological change as the advent of digital technology ushered in a new era of globalisation thanks to satellite television and then the Internet, despite some attempts by ultraconservative Islamic clerics to prevent this (Cochrane, 2007). More recently, Saudis have embraced social media, with studies showing that KSA's online population has the highest percentage of active Twitter users in the world, with 32% of Saudis posting on Twitter at least once a month (Mari, 2013 cited in Albakhail, 2016). Saudis also account for 47% of all tweets posted in Arabic on Twitter (Estimo, 2015 cited in Albakhail, 2016).

Research has also shown that a great deal of communication between Saudis takes place in this virtual sphere. For example, an IPSOS survey conducted in 2013 (cited in Albakhail, 2016) ranked KSA as the top country in the world in terms of its level of online sharing, with over 60% of Saudis stating they shared 'everything' or 'most things' online. This included personal feelings in addition to existing content. As Bertot et al. (2012) note:

> Social media is collaborative and participatory by its very nature as it is defined by social interaction. It provides the ability for users to connect

[1] This situation may begin to change. At the time of writing, the collapse in prices in the global oil market has begun to profoundly impact on KSA's state finances and the fiscal budget for 2016 revealed a deficit of 326.2 billion Saudi riyals (Mubasher, 2016). More will be said about the potential impact of this on thinking about school food provision in the concluding chapter of this thesis (Chapter Eight).

with each [other] and form communities to socialize, share information, or to achieve a common goal or interest (p.30).

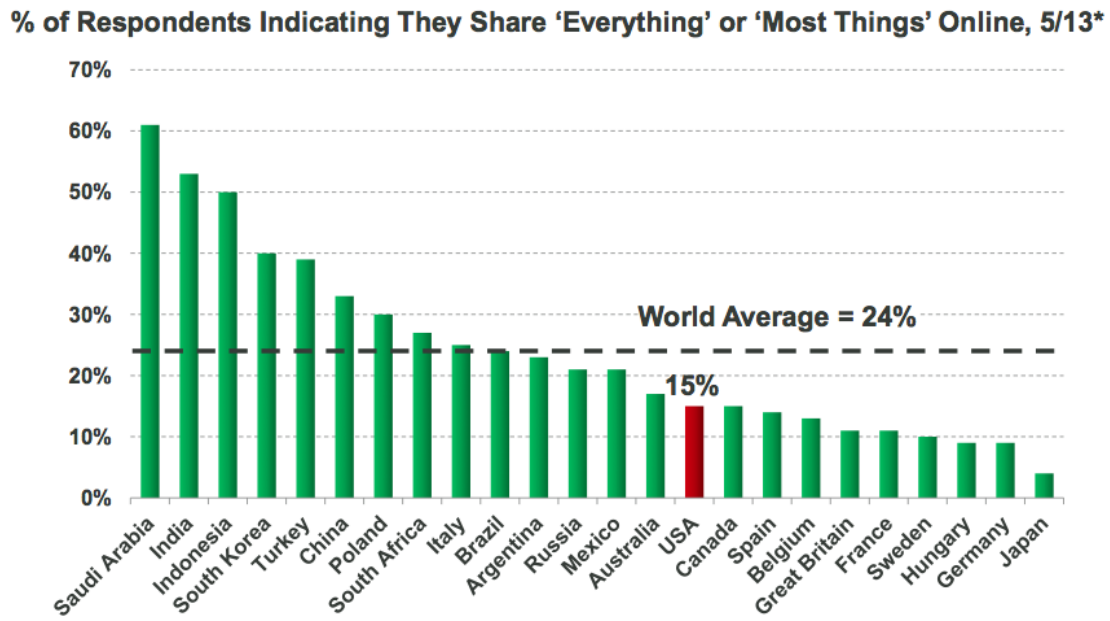

Figure 2.4 Sharing online by nationality (IPSOS cited in Albakhail, 2016)

In KSA, social media platforms such as Twitter serve as a two-way communication channel for debating issues of social interest. According to Albakhail (2016), social media have created a virtual public sphere in a society where, for various reasons, civil society as it is understood in Western democracies does not exist and there is limited freedom for the press.

2.2.3 Continuity

Although economic prosperity and technological developments have brought changes to KSA, it still continues to be a socially and religiously conservative society. The practice of strict gender segregation, for example, is still found in almost every private and public institution in the Kingdom and is based on both particular interpretations of Islamic teachings and Arab sociocultural traditions regarding gender roles (Al-Munajjed, 1997). The primary schools participating in this study were single-sex, with boys being taught by an all-male staff and girls by an all-female staff. This had a number of implications regarding how some elements of the data collection were carried out (see Chapter Four) although gender was not one of the areas of primary interest in this study.

Islamic belief provides the major source of continuity within the Kingdom. It must be remembered that KSA is custodian of what Muslims consider to be the

two holiest cities in Islam, Makkah and Medina (the latter being the setting where this study was carried out). The first of these is seen as the heart of the Islamic world, as it marks the direction in which all Muslims face to pray. This gives KSA a special significance within the Islamic world since it: "considers itself the guardian of Islam and of Islamic values throughout the world" (Winberg, 2005: 5). Every year over three million Muslims from all over the world go on pilgrimage (*hajj*) to Makkah (Winberg, 2005: 7)[2] and a large proportion of these will also visit the city of Medina either before or after completing *hajj*.

Medina is also known in Arabic as *Al-Madīnah al-Munawwarah* (literally, the Radiant City) due to its special religious significance for Muslims since it houses the burial place of Muhammad himself in *al-Masjid al-Nabawi* (the Prophet's Mosque). As is the case with Makkah, only Muslims are allowed into the sanctuary area of the city (known as *Al-Haram*), although many facilities on the outskirts of Medina are open to all (Esposito, 2011: 5). The latest available official figures put the population at 1,180,770 (SAMIRAD: online).

Although it has ancient roots, Medina is now a modern, multi-ethnic city and like other areas of KSA, it is home to large numbers of foreign workers, some of whom are now third-generation settlers (Bel-Air, 2014). Many have their origins in the Middle Eastern region, coming from neighbouring countries such as Egypt, Jordan, and Lebanon. This means they share many cultural similarities with the Saudis, including their Arab cuisine. Many others come from South Asian countries such as Bangladesh, India or Pakistan, or from the Philippines (Bel-Air, 2014). This multicultural mix is also found in many of the city's schools and indicates the need to consider this cultural diversity when thinking about Saudi state primary schools as an Organizational Nutrition Environment.

Medina is located in the north-western part of KSA in the Hejaz region (see Figure 2.3) and is surrounded by hills and mountains, meaning that water supplies are abundant there (Watt and Winder, 2007). Historically, the region of Medina was known as a highly productive oasis due to the fertility of its volcanic soil and had a strong tradition of growing vegetables and dates, a foodstuff which still plays an important role in Saudi cuisine and in its cultural traditions. A

[2] Islamic belief is based on the five so-called Pillars i.e. the ritual duties which Muslims must carry out. *Hajj* is the fifth of these pillars and refers to the obligation for all adult Muslims to attempt to make a pilgrimage to Makkah at least once in their lifetime.

Western visitor to the Medina region in 1920 recorded 139 varieties of dates being grown in the area, including the highly prized Ajwa variety, noted for their health benefits (Watt and Winder, 2007). However, according to a World Bank report issued in 2014, KSA now imports 80% of its food requirements from countries outside the region, and its own agricultural production is declining due to factors such as soil erosion, water scarcity and climate change (cited in Taha 2014: online). This indicates some of the problems which KSA faces both in terms of food security and sustainability. In the context of Glanz et al.'s (2015) Consumer Nutrition Environment, the necessity to import such large quantities of food and the growing population of KSA clearly has implications for price and availability of healthy options in relation to school food provision.

Having established the context for this study of primary school food provision in the Saudi city of Medina, the next section explores the extent to which Islamic beliefs shape KSA's nutrition environment.

2.3 The Islamic nutrition environment of KSA

Mellahi and Wood (cited in Rasheed 2010: 8) argue that many of the sociocultural practices found in KSA can be attributed to two main inter-related factors: "the influence of religion, and the influence of tribal and family traditions". Of these two factors, Islam remains the major force "in determining the social norms, patterns, traditions, obligations, privileges and practices" (Winberg, 2005: 5).

As Bell and Valentine note: "Food has immense symbolic importance to many religions" (1997: 105). This is certainly the case for Islam. Firstly, it has a number of dietary laws that originate directly from the Qur'an and its adherents are expected to follow these. As El-Zibdeh (2009: online) explains:

> All foods are considered *halal,* or lawful,[3] except for pork and its by-products, animals improperly slaughtered or dead before slaughtering, animals slaughtered in the name of anyone but *Allah* (God), carnivorous animals, birds of prey, animals without external ears (some birds and reptiles), blood, alcohol and foods contaminated with any of these. All seafood is *halal*.

[3] Although many non-Muslims think of *halal* purely in terms of describing meat from animals slaughtered according to the Islamic ritual method, a different term *zabiha* is used to refer specifically to this form of slaughter.

Halal literally means 'lawful' in reference to what is allowed by Islamic law; anything unlawful is *haram*. Another adjective *mashbooh* is used to refer to a third category of food or drink when it cannot be determined if this is *halal* or *haram* due to the variety of ingredients it contains. Since many processed food products may contain by-products that may be derived from sources that are considered *haram*, many Muslims choose to buy and eat only *halal*-certified products.[4] This Islamic dietary law is reflected in Saudi government policy since all food supplied to state schools in KSA must be *halal*-certified.

Secondly, beyond this set of dietary laws, certain foods that are mentioned in the Qur'an or in *Hadith*[5] have assumed a particular spiritual value and symbolic importance for Muslims. These can also form an important part of the perceived food environment for Saudi children, who will be taught that food such as "Olives, honey, yogurt, dates, figs, grapes, pomegranate, and legumes" (El-Zibdeh 2009) have a special significance beyond their purely nutritional value. Although many of these foodstuffs featured prominently in the traditional diet of the Arabian Peninsula, most of them are now much less frequent in the modern Saudi diet, occurring largely as ingredients in processed food when they occur at all.

The exception to this is dates, which are still closely related with Arab hospitality and represent "the only Arabian traditional food which has not been given up to the winds of change" (Al-Abdullateif, 2002: 133). Farghaly et al. (2007) found that dates continued to feature as a snack in the diet of 87% of the intermediate grade Saudi students they surveyed on their eating habits.[6] This is probably also due to the fact that dates are one of only two foodstuffs (the other being milk) which according to KSA's School Canteen Regulations must be available for sale every day (see 2.4.7 and Appendix), indicating how accessibility to a particular foodstuff in the school environment can influence food choices.

Thirdly, fasting (*sawm*) during the month of Ramadan (the ninth month in the Islamic calendar) is the fourth of the five Pillars of Islam and is greatly valued by

[4] For further explanation of this point see The Muslim Food Board's discussion of the example of whey powder http://www.tmfb.net/what-is-halal-/what-is-halal.
[5] *Hadith* refers to accounts of the words action or habits of the Prophet Muhammad. These also form an important part of Islamic tradition.
[6] For an overview of the nutritional value of dates as a food, see M. A. Al-Farsi and C.Y. Lee (2008) Nutritional and functional properties of dates: A review, *Critical Reviews in Food Science and Nutrition*, 48 (10), 877-887.

Muslims as a spiritual practice. In an Islamic state like KSA, during the month of Ramadan community, organizational and consumer nutrition environments are totally transformed and individual eating patterns and food choices shift dramatically. During the whole month of Ramadan, adult Muslims fast from before sunrise to after sunset. They must abstain from all foods and beverages, including water, as well as smoking. During this month, one main meal, *suhur*, is eaten immediately before performing prayers at dawn whilst the other, *iftar,* is eaten immediately after sunset before the evening prayer. Fasting is not obligatory for children prior to puberty, for women who are menstruating, pregnant or breast-feeding, for travellers, the elderly or those who are ill (El-Zibdeh, 2009).

During Ramadan, most primary school-age children eat breakfast, a snack if they are at school, and take a small, simple meal alone in the afternoon when adults are still fasting. Children also take part in *iftar* and this family event usually includes water, dates, coffee, soup, a main dish, and a variety of sweet dishes. Ramadan specialities are often prepared.

Research on the effect of religiously motivated fasting on health has shown a marked increase since the 1990s but "little consensus exists regarding the effects of Ramadan fasting on the majority of health-related outcomes […] due to confounding variables" (Trepanowski and Bloomer, 2010: online).

Although many of the traditional Arabian culinary customs such as eating from a common platter (*sufrah*) whilst sitting on the ground are no longer maintained in contemporary KSA, other eating habits are still influenced by the practices of the Prophet Muhammad as recorded in *hadith*, including eating with the right hand and invoking the name of God at the start of the meal by saying "*Bismillaah",* the opening phrase of the Qur'an (Elmadani, 1997). Traditionally, Muslim households have avoided wasting food, paying attention to the Qur'anic verse: 'Those who squander are the brothers of Satan, and Satan is most ungrateful to his Lord" (*Qur'an* 17:27).

In the last twenty years or so, growing numbers of Muslims, particularly those who have converted to this religion in western countries, have begun to reassess their attitudes towards the consumption and production of food. They have begun to re-read the Qur'an in the light of contemporary debates about the environment and sustainability. As Ereckson (2004: 2) notes:

> Most Muslims are familiar with the concept of *halal* […]. But we tend to be less familiar with the concept of *tayyib* (pure/ethical/wholesome/good). Nearly everywhere that we are enjoined in the Qur'an to eat only of the *halal, tayyib* is explicitly mentioned as a necessary quality as well.
>
> > Oh, you people, eat from the earth what is *halal* and t*ayyib*, and follow not the footsteps of the *Shaytan* [Satan] (*Surat al-Baqarah* 2:168)
>
> But in this age, *tayyib* has been largely forgotten.

This shift has been referred to as Eco-Islam (IFEES, 2015) but to date it has only impacted on the perceived nutrition environment and consumer nutrition environment of a relatively small group of Muslims who tend to belong to the predominantly affluent classes.

This movement has seen an increased interest in organic, locally sourced food, from animals that are "not given growth hormones, antibiotics, or genetically modified foods crammed with animal by-products" (Kuruvilla, 2014). The UK-based Islamic Foundation for Ecology and Environmental Science (IFEES) founded by the Sri Lankan, Fazlun Khalid, campaigns on environmental issues and highlights the need for Muslims, particularly those in oil-producing countries, to take the lead on adopting a more sustainable lifestyle. The organization's website notes:

> The Holy Qur'an enjoins over and over, "Waste not by excess, for Allah loves not the wasters," and, "Do not pollute the earth after it has been (so) wholesomely (set in order) ..." (*Surat al-A'raf* 7:56).

Whilst there have been numerous initiatives in the UK and beyond aiming to bring a more sustainable approach to the provision of school meals together with campaigns to improving the quality of the food served to children (Morgan and Sonnino, 2008), to date there has been little attention given to this topic in KSA.

2.4 The organizational nutrition environment of state primary schools in KSA

The previous section highlighted the extent to which Islamic beliefs permeate all aspects of the KSA nutrition environment. The focus in this section now shifts to the organizational nutrition environment of state primary schools in KSA. This will help to identify some of the factors which influence school food provision and the ways in which the nutrition environment also shapes the perceived nutrition environment of groups and individuals, affecting the attitudes of 6-12

year olds towards food, their food choices and their eating patterns. Before considering school food provision, however, it is useful to understand more about the education system within which this is delivered.

2.4.1 The education system in KSA

Oil revenues have been used to encourage social development in its widest sense in KSA, with a particular emphasis on health, social services and education. The Saudi education system has played a major role in the transformation of KSA since 1945, when King Abdulaziz bin Abdulrahman Al-Saud originally began an extensive programme to establish basic education in what was then still very much an underdeveloped nation (Ministry of Education: online). When the Ministry of Education was established in 1953, it was specifically tasked with "expanding the national school system, to give it a modern basis comparable with that of Western states" (Al-Sadan, 2000:145). Originally, schooling was only offered to boys; however, in 1956 the first school for girls was opened in Jeddah (Ministry of Education: online).

Several different government agencies are involved with planning, administrating and implementing educational policy in KSA but the Ministry of Education, based in the Saudi capital, Riyadh, sets overall standards for the Kingdom's educational system, for both public and private schools, covering everything from pre-school nurseries all the way through to higher education (Saudi Embassy Information Office, 2016). The Saudi educational system is highly centralised and all educational policies, including those relating to school food provision, follow a 'top down' sequence. All schools throughout KSA, whether public or private, must follow not only the same policies, but also the same curricula and recommended teaching methods (Al-Sadan, 2000).

As Figure 2.5 shows, kindergarten is not a compulsory stage of education in KSA, and the vast majority of Saudi children start compulsory schooling at the age of six. All three stages of compulsory education (elementary,[7] intermediate and high school) are provided free of charge in state schools (Saudi Embassy Information Office, 2016). Students are expected to successfully complete each stage before moving onto the next.

[7] The translation on the Saudi Embassy Information Office is intended for an American audience and therefore refers to 'elementary school'. In this thesis, the terminology 'primary school', more commonly used in the UK context, is employed.

STAGE	AGES	QUALIFICATION
Kindergarten	3-5	
Elementary	6-12	Elementary school certificate*
Intermediate	12-15	Intermediate school certificate*
High school	15-18	High school diploma*
Diploma	18+	Diploma
Undergraduate studies	18+	Bachelor Degree (5 years)
Postgraduate studies	24+	Masters or PhD

*All three of these stages are compulsory for Saudi students

Figure 2.5 The Education System in KSA

There are approximately 25,500 public schools in the Kingdom and over 5 million students and overall this age group represents approximately 20% of the population of KSA (Jiffry, 2014). The vast majority of children are enrolled in public schools (73.9% of male and 78% of female students) (Ministry of Education: online). Some 75% of the teachers in both public and private school are Saudi citizens, with the remaining posts in the state sector being filled by staff from Arabic-speaking countries in the region, typically Jordanians or Egyptians (Ministry of Education: online). This study collected data from state primary schools situated within the city of Medina, catering for boys and girls between the ages of six to twelve.

The academic year is divided into two semesters, each of which lasts for approximately twenty weeks, including a two-week examination period. However, since the Islamic calendar is used, start dates for the academic year may vary significantly from one year to the next depending on the timing of Ramadan (the month of fasting).[8]

As Figure 2.6 shows, daytime temperatures during the summer months in the Hejaz region of KSA where Medina is situated are extremely hot, as is the case for much of the Arabian Peninsula. Although most modern buildings in KSA now

[8] The Islamic calendar is based on the lunar cycle and consists of 12 months containing 29 or 30 days each. This means that the Islamic year is approximately 10 days shorter than the Gregorian one used in the western world and, as a result, the timing of Ramadan shifts every year (El-Zibdeh, 2009).

have air conditioning, reports regularly appear in newspapers concerning school closures due to faulty air-conditioning.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Daily mean °C (°F)	17.9 (64.2)	20.2 (68.4)	23.9 (75)	28.5 (83.3)	33.0 (91.4)	36.3 (97.3)	36.5 (97.7)	37.1 (98.8)	35.6 (96.1)	30.4 (86.7)	24.2 (75.6)	19.8 (67.6)	28.6 (83.5)

Figure 2.6: Daily mean temperatures for Medina 1985-2015 (Source: Jeddah Regional Climate Centre)

As a result, in order to avoid travelling and classes during the hottest periods of the day, school start time throughout KSA is very early in comparison to that of the UK. In the summer semester, classes typically start at 7.00am and end for the day at 1.45pm; start and finish times are about 30 minutes later in the winter semester. Opening times for girls' and boys' schools are staggered in order to allow families with both sons and daughters to ensure that they can arrive at school in time. Children often need to wake up between 5.30 and 6.00am and, as a result, many may not have the appetite for breakfast before going to school or time to eat anything substantial before starting the school day. As the literature review (Chapter Three) demonstrates, numerous studies investigating the impact of skipping breakfast on the diet of Saudi children and adolescents have highlighted the negative effects of this eating pattern.

Typically, state schools in KSA have one mid-morning break which is the principal time when children have access to the food and drinks sold on school premises or are able to consume items they have brought in from home. Currently the concept of the school lunch-break as understood in the UK context does not exist in state primary schools in KSA.[9]

2.4.2 Healthy eating and the school curriculum

With regard to the national curriculum in KSA, there is currently no equivalent of personal, social, health and economic (PSHE) education or of the type of teaching of cooking and nutrition that would be found in the English national curriculum at Key Stages 1-3. However, via the General Directorate for School Health (GDSH), the Saudi Ministry of Education runs a number of awareness-raising initiatives within schools as part of its preventative health services aimed

[9] Anecdotal evidence provided by Al-Sibai (2012) shows that that privately run schools in KSA, particularly international schools, do offer school meals (*Saudi Gazette,* 2013).

at maintaining and monitoring the health of students throughout their school years.[10]

These programmes are often linked to broader public health concerns (for example, prevention of dental caries) or to themes identified by the World Health Organisation and are designed to target different age groups. At the primary level, these programmes include the Brush Your Teeth Every Day oral health programme and the World School Milk Day initiative (AlGhamdi, 2009). Targeting school children is seen as an effective means of reaching a captive audience that makes up a significant proportion of the national population. Moreover, children are often effective transmitters of knowledge concerning health matters to their families and communities. This may be particularly important in those families where the parents had limited opportunities to benefit from education themselves (AlGhamdi, 2009). However, involvement in such initiatives is voluntary.

2.4.3 The School Feeding Programme in KSA (1976-1981)

While the history and development of the school meals programme in the UK has been the subject of research (see, for example, Nash [1969] and Colquhoun et al. [2001]), as the literature review (Chapter Three) illustrates, to date no academic publications exist about this topic in the Saudi context. It is only fairly recently, in the context of growing concerns about childhood obesity, that Saudi researchers have begun to turn their attention to school food provision in any detail and for the most part, their focus has been on conducting empirical studies concerning the association between children's eating patterns/food choices and obesity. However, in 2015, *Al-Riyadh* (a Saudi newspaper) published a feature-length article on the school feeding programme in KSA, illustrated by archive photographs (see Figure 2.7, for example) taken in the 1970s. This provides some insights into the shortcomings in past government policy in this area.

A School Feeding Programme existed from 1976 to 1981 but at that time it only covered boys' primary schools. The reasons why girls' schools were not

[10]The GDSH is also responsible for carrying out medical check-ups of all new students, administering vaccinations, treating students and staff, providing medical support for school sports events, offering first-aid training in schools, monitoring for epidemics, and running school clinics (Ministry of Education: online).

included in the programme is not mentioned in the article. As the photograph shows (Figure 2.7), each pupil was given a cardboard lunchbox containing food in a ring-pull tin, a drink and wipes intended to be used for cleaning hands. Children were expected to eat seated at their desk in the classroom.

Figure 2.7: The School Feeding Programme (Source: *Al Riyadh*)

Perhaps the most interesting aspect of the article is the journalist's account of the reasons that led to the programme being abandoned as they point to the crucial importance of taking into consideration the nutritional environments in which school food is to be consumed. The tinned food included in the school lunchboxes was produced by an Italian company and imported by sea into KSA. Many of the ring-pull tins were damaged during this long voyage from Italy or later in the process of being delivered by road to the schools within KSA as the cardboard boxes they were later packed into failed to adequately protect the contents. As a result, wastage rates were high.

In addition, due to the long distances involved in transporting food across KSA, large quantities of meals were delivered to schools to make distribution more cost effective. However, many schools did not have adequate storage facilities for the lunchboxes when they arrived, meaning that yet more were then spoiled due to the high temperatures they were exposed to, leading to further wastage.

A further significant problem was caused by the fact that the Italian tinned meals did not cater for local tastes or take into consideration that children might not want to consume heavy food in the high temperatures frequent in KSA. Photographs published in *Al Riyadh*'s article show tinned meals labelled 'beef casserole', 'ravioli' and 'chocolate pudding'. When temperatures are high,

children need light nutritious food that is easy to digest.[11] Teachers then began to raise safety concerns about the tinned meals since younger children experienced problems with opening the ring-pull lids and often cut themselves on sharp edges.

A further concern emerged which was unrelated to the food itself but to what it was thought to represent. The meals were intended to be distributed free to all primary school pupils, as a government initiative to improve the general nutritional standards of Saudi children. However, when better-off parents in urban areas found out that this food was free and intended to improve standards of nutrition, they refused to let their children eat the meals, on the grounds that they saw this as a degrading form of unneeded and unwelcome charity. Hoping to avoid yet more wastage, many schools then started to distribute left-over meals on a random basis to those they judged to come from families most in need of help. As a result, in some instances they succeeded in socially stigmatising the recipients of the food amongst their classmates. In other schools, head teachers distributed left-over food to family members or friends, creating feelings of resentment among need parents and also staff who believed they should also have benefited from what was seen as a perk of the job.

Last but not least, financial difficulties also intervened as the foreign company contracted by the Saudi government to produce the school meals had requested payment in Swiss francs, a currency that began to witness a steady surge in the later 1970s, and the new exchange rates considerably raised the price per meal. The combination of all these factors meant that the free School Feeding Programme that had originally seemed to provide the ideal solution to malnourishment for children from vulnerable families was abandoned by the Saudi government.

In short, this costly failure serves as a cautionary case study illustrating how not to run a School Feeding Programme. It also highlights that policy decisions and

[11] See B. M. Marriott 1993 *Nutritional Needs in Hot environments: Applications for military personnel in field operations* (Washington: National Academies Press). Although this study focused on US military personnel involved in Operation Desert Storm in 1991, it provides a useful insight into a number of issues relating to food and nutritional needs in climates like those of KSA.

government initiatives regarding school food provision need to recognise the complexity of the nutrition environment.

2.4.4 The School Milk Programme

Further insights into the challenges that may be posed by interventions in the school nutritional environment can be gained from the Ministry of Education's attempts to promote milk consumption in schoolchildren by a School Milk Programme in the early 2000s.

The need to increase levels of milk consumption was partly linked to the fact that several studies had found vitamin D deficiency mothers during the prenatal period and infants in KSA was causing a resurgence of rickets (Madani, 2000) The causes of this vitamin deficiency in KSA have been attributed to a range of social and environmental causes including prolonged periods indoors and the use of clothing which limits exposure to sunlight, low levels of vitamin D in breast milk, reduced ultraviolet levels as a result of airborne dust particles and consumption of nutrient-deficient junk fund (Ghannam et al., 1999; Al-Jurayyan et al., 2002; Al-Daggrey, 2014).

Given that the consequences of vitamin D deficiency are aggravated by a low calcium intake (Lips, 2012), the low levels of milk and dairy product consumption in KSA were seen as concerning. The Ministry of Education's lifestyle survey (2004) found that per capita consumption of dairy products (including milk, flavoured milk and liquid yoghurt) was 50.8 litres/capita and that students' milk consumption decreased with age whilst the opposite trend was true for fast foods. The estimated consumption of milk among boys in schools at that time was found to be just 150ml compared to a recommended daily consumption of 800 ml (Ziriniski, 2005).

Concerned by the potential effects of low dairy consumption, the Ministry of Education launched a nation-wide programme in 2004 to promote milk consumption in all boys and girls schools in conjunction with the National Dairy Committee. However, the milk was not free or subsidized (Al Ghamdi, 2009). Health education activities linked to the School Milk Programme consisted of seminars, lectures and printed promotional material aimed at teachers, schoolchildren, families and community leaders. The Ministry also encouraged Saudi schools to participate in specially prepared activities on World School

Milk Day, an initiative pioneered by the Food and Agriculture Organization of the United Nations (http://www.fao.org/economic/est/est-commodities/dairy/school-milk/en/).

However, rather like the School feeding programme, the School Milk Programme faced a number of obstacles which eventually led to its abandonment. First and foremost, the government's promotion of milk was in competition with multinational soft drink manufacturers that had spent substantial sums of money on advertising in the Gulf States to create an deep-rooted habit of consuming soft drinks at meal times. Their message was an extremely powerful one that was not likely to face serious opposition from a short-term government-backed initiative (Naeem, 2012).

Secondly, one of the main reasons why soft drinks are so aggressively marketed to young consumers is that they are so profitable, with the price per cup allowing for a profit margin of up to 97% (Naeem, 2012). Thus, unsurprisingly, the catering companies contracted to provide stock for school canteens preferred to continue to sell soft drinks rather than milk to pupils since the former product generated much higher profit margins than could ever be possible from the latter.

Thirdly, at school level, the School Milk Programme was also unpopular with teachers since it was dependent on their unpaid extra efforts and included the compilation of monthly sales reports, adding extra administrative burdens to already busy schedules.

Finally, although the campaign urged parents to buy milk for all their children, no financial incentives or subsidies were offered to encourage purchase and some of those with large families simply could not afford to do this (Al Ghamdi). The School Milk Programme was eventually abandoned and has not been replaced by any similar initiative.

It is perhaps not surprising that little has changed with regard to milk consumption by Saudi schoolchildren. Farghaly et al. (2007) found that only 51.5% of their sample regularly consumed milk whilst 11% of students did not drink milk at all. In their study, Amin et al. (2008) found that low consumption of milk and dairy products correlated with low consumption of fruit and vegetables was a possible predictor of excess weight and obesity among young students.

2.4.5 Current school food provision

It should be said from the outset that the concept of school food provision as it currently exists in KSA's state primary school bears no resemblance to what might be typically seen in UK primary schools. Any references in the literature to 'the school canteen' or 'school meals' can prove misleading as Saudi school food provision might be more accurately likened to the British concept of 'the tuck shop'. The dining hall or the self-serve facilities specifically intended for purchase and consumption of food commonly found in UK schools have no equivalent in the public primary school sector in KSA. Typically, primary schoolchildren do not sit down to eat a meal, but instead buy a snack from the school shop and then usually stand with other children either in a school corridor or gather outside in a shaded area of the school yard, if this exists.

The school may opt to provide its own food. However, more usually, an outside company, often a local family-run business, is contracted to provide food and personnel to prepare and sell the food to children, which usually takes the form of ready-prepared sweet and savoury snacks. In smaller schools, this company rents one room on the school premises, which also doubles as their stockroom, and food is sold to children from a table across the doorway of the room (Figure 1.8).

Figure 2.8: School food ready for sale (Source: researcher's own image)

Larger schools have a sales window where children come to buy their school food. Since usually all the children break from classes at the same time, it can

be very difficult for them to get served in the small amount of time available. School Canteen Regulations (see Appendix) specify that:

> The size of the canteen and the number of sales windows must be sufficient for the student population with not less than five windows at large schools. There should be at least one salesperson per one hundred students. The height of the sales windows should be appropriate for each school stage (School Canteen Regulations Part I.2).

However, as Figure 2.9 illustrates, often this process is chaotic with long, unruly queues and smaller children being pushed aside. Parents and teachers interviewed for this study spoke of fights breaking out at boys' schools when children try to push their way to the front of the queue (see Chapter Five). None of the school staff play any role in the sale of school food or the supervision of this process and there is usually no monitoring of what individual children choose to buy.

Figure 2.9: Mid-morning food break at a boys' primary school (Source: *Al-Riyadh*)

The cashless payment systems now adopted by many schools in the UK mean that children do not need to bring money onto school premises to pay for food and also mean that children receiving free school meals can remain anonymous. However, in state primary schools in KSA, children buying food from the school shop still receive money from parents on a daily basis which has the potential to lead to feelings of resentment from classmates from poorer backgrounds, and may also lead to theft and bullying.

Some 10% of the profits made from the sales of food on school premises must be paid every quarter to the Ministry of Education with the local Education Authority School Canteen Inspector producing the estimates of expected profits on the basis of the numbers of students enrolled in each school (interview, former school canteen inspector). The remainder of the profits are split on an agreed basis between the food supplier and the school itself. (Further discussion of the potential impact of this financial arrangement can be found in section 7.3.2).

2.4.6 Stakeholders and influence

Before evaluating the current system of regulation and monitoring, it is worth briefly considering the two main groups of stakeholders whose opinions are surveyed in this study. Griffiths et al. (2007) note that in the context of public health policy, the term 'stakeholder' may have different shades of meanings. In the context of Saudi school food provision policies and initiatives, both parents and teachers are viewed as stakeholders in the sense that both stand to be affected by these policies and initiatives to a greater or lesser extent and have an interest in this issue, whether in a personal or professional capacity. Clearly, primary school teachers who are also parents of 6-12 years olds can be considered to have perhaps a slightly different form of stakeholder status.

In order to fully understand some of the comments made later in interviews by these stakeholders, it is important to remember that there are many differences between the socio-political contexts of KSA and the UK, meaning that Saudi citizens would employ different methods of attempting to influence Government policy (see section 7.7.3).

There appears to be just one non-governmental organization in KSA which focuses on health education and health promotion. This association, known as *Hayatona* (Life), refers to itself as a health awareness charity and has run one campaign previously about the need to improve the quality of school food (Hayatona website).

At the more localised level of the school as an organizational nutrition environment, the concept of the Parent-Teacher Association or of stakeholder representation on the Board of Governors as it might be understood in the UK does not currently exist within the Saudi public sector. Similar systems have

been adopted in some private international schools in KSA. This means that parents with concerns or complaints about school food would be expected to make direct contact on an individual basis with the school manager, an administrator at the Local Education Authority or even a Ministry of Education representative. For various reasons, in Arab societies, like KSA, there is a much less strict separation between the private domains of family and friendship and the professional domain of work than would be found in most western societies. Consequently informal face-to-face communication and interaction of this type with the authorities is seen as the norm and may often be preferred (Hofstede and Peterson, 2000).

However, repeated single complaints often lack the force of a collective expression of concern. This may indicate why it is increasingly common for both parents and teachers to air their complaints about all aspects of the education system, including school meals, via social media which, as previously noted, now acts as an increasingly important alternative forum for discussion of social issues amongst Saudi citizens (see section 2.2.2).

2.4.7 Regulation and monitoring

The School Canteen Regulations (SCR) were issued by the Saudi Ministry of Education on 11 April 2012. They consist of six sections and are accompanied by the Inspection Form as an appendix. They cover a range of areas including environmental health, public health, personal hygiene, nutritional standards/guidelines, food safety and hygiene, health and safety at work, and administration, although the introductory section places a heavy emphasis on the nutritional role of the canteen.

The SCR begin as do all Saudi government publications with the opening words of the Qur'an "In the name of Allah, the Most Merciful, the Most Compassionate", stressing that everything and everyone is subject ultimately to divine authority.

S**ection 1: Introduction** effectively offers a rationale for introducing the inspection of school canteens. It highlights the importance of healthy and balanced nutrition for students of school age and acknowledges the trend towards skipping breakfast and overconsumption of junk foods, linking academic performance to nutrition. This section provides a useful insight into

the principles underlying the SCR and the inspection process, which it claims are based on existing good practice in this field. According to SCR, the principal objective of the school canteens is “to consolidate the students' concept of healthy nutrition as well as to provide them with useful foods at an affordable price”. The SCR also emphasise the need to cater for “the nutritional and physiological needs” of school children, and the school canteen’s critical role in “forming students' ideas about nutrition” and its impact on health. The final point that it stresses is that the SCR are “applicable, flexible and adjustable according to each school’s conditions with respect to: the school premises and its location as well as the student population”. The vagueness of this final point, whether intentionally or not, seems to give inspectors considerable scope for discretion in how they choose to interpret the SCR.

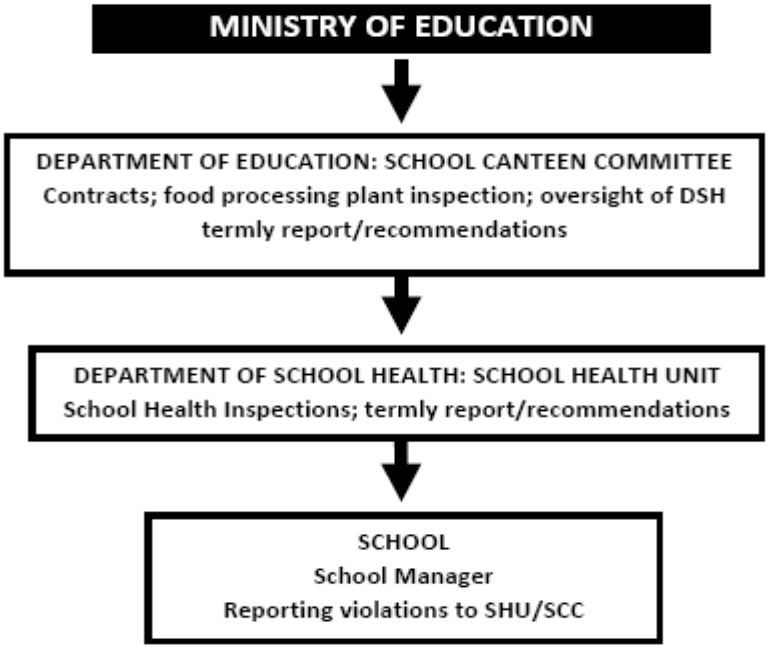

Figure 2.10: The school canteen inspection process

Section 2 Control and Supervision of School Canteens outlines the roles and responsibilities of those involved in enforcing the SCR. However, in reality, as Figure 2.10 illustrates, it remains unclear where the actual responsibility for guaranteeing compliance with the nutritional guidelines/standards lies. The School Canteen Committee (SCC) inspects food processing plants while the School Health Unit seems to focus predominantly on the health status of the

food handlers, which forms only one part of the inspection process. Ultimately the school manager appears to be bear responsibility for reporting violations of any regulations. Despite the heavy emphasis placed on the nutritional importance of the school canteen, the SCR suggest that representation of a nutritional expert on the SCC is not guaranteed. Furthermore, although the SCR mentions the production of reports and recommendations, it is not entirely clear what purpose these serve when they reach the SCC. In short, although the SCR outline duties and responsibilities, these are vague and the process lacks transparency and accountability.

Section 3 Specifications of School Canteens provides often detailed requirements covering the location, layout, design, construction and size of the premises. They also stipulate the materials to be used, together with the facilities and equipment which it should contain. Finally, they provide instructions covering safe and hygienic canteen operations. There is a serious omission here from the requirements which points to a major shortcoming in the approach which the inspections follow. The high temperatures in Medina and throughout KSA's regions make it imperative not only to have refrigeration equipment in order to maintain the freshness of food but also to have in place a system that ensures that the temperature of this is regularly monitored, not only to prevent wastage but more importantly to prevent the growth of harmful bacteria or the formation of toxins that could go undetected visually if equipment fails to keep food at the correct temperatures (Al-Mazrou, 2004).

The most widely accepted standard food safety management procedures follow the principles of HACCP (hazard analysis and critical control point) which emphasise the need for establishing procedures to control potential hazards. The Food Standards Agency, which conducts inspections of all school canteens throughout the UK, summarises HACCP thus:

1. Look closely at what you do and what could go wrong.
2. Identify 'critical control points' – places you need to focus on to prevent hazards or reduce them to an acceptable level.
3. Put in place procedures to make sure hazards are controlled at critical control points.
4. Decide what action you need to take if something goes wrong.
5. Make sure that your procedures are working.
6. Keep appropriate records to show your procedures are working (FSA, 2013: 4).

This example demonstrates the very real health risks posed by an inspection regime that relies purely on completion of a compliant/non-compliant, yes/no checklist.

Only one section of the SCR relates directly to food standards: **Section 4 Food and Beverages Served at the School Canteen.** This section opens by stating that “appropriate and healthy foodstuff for this age group” has been “carefully chosen” by the School Health Unit. This is followed by a description of the food/drink items that are permitted/not permitted for sale in the school canteen. A further subsection entitled ‘Foodstuff Requirements’ deals with food safety and hygiene for food handling.

It is useful here to compare the list of permitted/prohibited food and drink provided in SCR and the approach which they take with standards/guidelines from the UK. The purpose is not to carry out a detailed comparative nutritional analysis but rather to highlight some of the difficulties posed by the SCR. Since it is not really feasible to compare the list of permitted/prohibited food and drink provided in SCR with the nutritional standards developed to cover full school lunches in the UK, two better points of comparison are the Nutritional Standards for Other Food and Drinks in Schools, which came into effect in 2008, and Healthy Breaks for Schools: A Guide for Pupils and Parents, produced in 2016. Both of these focus specifically on food and drink that can be sold/consumed in UK schools at break times or as snacks. The SCR are based on the Saudi equivalent of the Eatwell Plate, known as the Healthy Food Palm (Ministry of Health, 2012).

Table 2.1 provides a comparative overview of the food and drink listed in the SCR as permitted for/prohibited from sale in Saudi primary schools and relevant extracts from UK standards/guidelines. The SCR also specifies that none of the products sold should contain artificial sweeteners, preservatives or colourings.

As Table 2.1 shows, there are a number of areas where there is broad agreement across the standards/guidelines, with regard to acceptable food and drinks for children (for example, milk, water [tap water would not necessarily be considered a safe option in KSA], fruit and vegetables) and unacceptable foodstuffs (for example, confectionery and crisps/crisp-like snacks).

However there are also some key differences in relation to what can still be served in KSA but not in the UK. Biscuits, cakes and pastries continue to be

sold in Saudi school shops, as do sandwiches containing jam, honey and peanut butter. Moreover, dates are one of only two items (the other is milk) that must be available for sale in Saudi school (SCR section 6). UK standards now also explicitly acknowledge the impact of food/drink sold as snacks on dental health, as reflected in the guidance on dates.

One other key difference in the approach taken in KSA is the strict division made into permitted/prohibited without any real attempt to link these items to a broader nutritional context in which, say, falafel (currently banned as it is considered high in fat) with carrot/cucumber sticks would be a much more nutritious snack option for a child than a biscuit and a pastry.

Again, this strict division relates to how the inspection process is carried out, with the inspector simply noting the items on sale in the school canteen on a yes/no checklist. In theory, under this system, since there do not appear to be any requirements about needing to make a range of food/drink items available over the course of a week,[12] it would appear to be perfectly feasible for a canteen to sell only water, flavoured milk, dates, pastries and biscuits every day and still pass an inspection satisfactorily as long as no prohibited items were on sale.

[12] UK nutritional standards for school meals based on the Eatwell Plate clearly stipulate the range of food/drinks that schools must make available on a daily or weekly basis (http://www.legislation.gov.uk/uksi/2014/1603/pdfs/uksi_20141603_en.pdf).

Table 2.1:Comparison of Saudi School Canteen Regulations with UK school food provision nutritional standards/guidelines

SCR: PERMITTED FOOD AND DRINK (2012)	NUTRITIONAL STANDARDS FOR OTHER FOOD AND DRINKS IN SCHOOLS (2008)	HEALTHY BREAKS FOR SCHOOLS (2016)
Milk/Flavoured milk/Powdered Milk with iron	**Standard 6: Drinks:** The only drinks available should be: • plain water (still or sparkling); • milk (semi-skimmed is the preferred choice in schools); • unsweetened fruit or vegetable juices; • yogurt or milk drinks (with less than 5% added sugar); • drinks made from combinations of the above (e.g. smoothies);	Milk: all whole, semi-skimmed or skimmed unflavoured milk. Not suitable: fruit juices (including pure fruit juice)
Tetrapak fruit juices (Natural juice minimum 30% nectar)[13]		
Bottled water	**Standard 5: Water:** Children and young people must have easy access at all times to free, fresh, preferably chilled water.	Water: tap water or unflavoured, still, bottled water.
Machine packed dates	*Note to Standard 4:* Remember dried fruit has a higher concentration of sugars. Therefore in terms of dental health, it is not suitable as a snack between meals. It is best taken as part of a meal.	Not suitable: dried fruit (e.g. raisins, sultanas) These are high in sugar and can cause tooth decay, so are not suitable as between-meal snacks.
Biscuits/cakes/Plain biscuits	**Not allowed at breaks:** Cakes or buns of any kind; All biscuits;	
Wrapped pastry	**Not allowed at breaks:** Pastries	No pastries as these contain a lot of sugar and/or fat and salt.
Sandwiches: egg, jam, honey, spinach, cheese, *labneh* (soft cheese), peanut	**Not allowed at breaks:** Jams, marmalades and honey.	a small sandwich with a sugar-free filling Not suitable: Sugary spreads, including jam,

[13] "Fruit nectar is a product made by combining fruit juice, fruit juice from concentrate, dehydrated/powdered fruit juice, fruit puree or a mixture of these products with water and adding sugar and/or honey and/or sweeteners (within specific limits)" (UK Food Standards Agency The Fruit Juices and Nectars Regulations 2003 revised 2007: 6). This means that more of the original nutrients of the fruit are preserved in the fruit juice but there are more calories.

SCR: PERMITTED FOOD AND DRINK (2012)	NUTRITIONAL STANDARDS FOR OTHER FOOD AND DRINKS IN SCHOOLS (2008)	HEALTHY BREAKS FOR SCHOOLS (2016)
butter, beans, hummus		honey, as these are harmful to teeth. Peanut butter is high in fat and salt so is not recommended.
Fresh fruit	**Standard 4: Fruit and vegetables:** A variety of fruit and vegetables should be available in all school food outlets. This could include fresh, frozen, tinned, dried* and juiced products.	
Vegetables (e.g. cucumber sticks, carrot sticks)		
SCR: PROHIBITED FOOD AND DRINK (2012)	**NUTRITIONAL STANDARDS FOR OTHER FOOD AND DRINKS IN SCHOOLS (2008)**	**HEALTHY BREAKS FOR SCHOOLS (2016)**
Soft drinks and energy drinks	See **Standard 6: Drinks**	
Beverages/ juices with less than 30% nectar		Not suitable: fruit juices (including pure fruit juice),
Sweets of all kinds and chocolate	**Standard 1: Confectionery:** No confectionery should be sold in schools.	
Crisps and corn snacks of any flavour (sticks or chips)	**Not allowed at breaks:** Crisps and crisp-like products	
Foods about to expire		
Foods past expiry date		
Meat/liver	**Standard 8: Red meat** NOT REALLY COMPARABLE	
Falafel	**Standard 7: Foods high in fat** a) Fried and other high fat foods are restricted across the whole school day and should not be offered in total more than twice a week.	

Section 5 Health Requirements for School Canteen Food handlers lists the medical examinations, screening tests and immunizations that are required before any individual is allowed to work as a food handler. Once obtained, valid health certificates must be displayed for every food handler and all medical documentation must be verified by the inspector. This section of the SCR concludes with guidelines concerning fitness for work and personal hygiene. Since pathogens (viruses, bacteria and parasites) can grow and spread more easily in hot climates, high standards of personal hygiene need to be enforced to limit the potential for food-borne illnesses (Al-Mazrou, 2004).

The SCR conclude with miscellaneous information in **Section 6 Administrative Instructions for School Canteen Operation** and stipulate that the requirements found in SCR form part of the contract of the school food catering company**.** Although this is not detailed on the guidelines, schools found contravening regulations are expected to pay a fine (interview, school canteen inspector).

2.4.8 Latest developments

In 2013, the Ministry of Education commissioned a national study of school food on the basis of rising concern about increases in diabetes, high blood pressure, dental problems, and obesity among Saudi youth. The results of this were reported in the English language online newspaper *Arab News* (Jiffry, 2014). One of the author's of the study, Ghada Al-Kulaip, was quoted as saying that the food served at public schools had been found to contain high levels of saturated oils, fats and sugar. In addition, statistics gathered by the Ministry showed that the number of reported cases of food-poisoning cases among students had increased in 2013 as a result of reflect poor food safety standards in school canteens. The Ministry pointed to the lack of adequately trained professionals who were able to monitor the quality of the food served to students and related hygiene issues, which had increased the frequency of food-borne diseases (Jiffry, 2014).

As a result of this study, in February 2014, the Saudi Ministry of Education announced its intention to establish a new body entitled the Healthy Eating Commission to ensure that school canteens provided healthy food intended to significantly reduce the daily portion of calories being consumed by

schoolchildren, and increase the proportion of fibre and vitamins in their diet (Jiffry, 2014).

The general remit of the new Healthy Eating Commission was announced as being “to change the eating habits of students and also help them make healthy food choices.” (Jiffry, 2014) More specifically its aims were:

- To ensure that unhealthy foodstuffs were removed from the menus provided to school students,
- To grant licenses to food catering companies who would be contracted to provide nutritious meals for students according to Ministry-defined health standards for food and beverages.
- To monitor the quality of food and the calorie count of the food provided to students at public schools.
- To establish canteens providing fresh food and juices in the neighbourhoods adjacent to schools (Jiffry, 2014).

Observation carried out in schools in Medina in 2015 while conducting interviews for this study suggested that little progress had been made in removing the foodstuffs containing high levels of saturated fat and sugar. Moreover, it is concerning that the aims of this initiative do not appear to recognise the need to look more broadly at the nutritional environment of the school and at the culture and ethos that influence children’s food choices and eating patterns at school and elsewhere.

2.5 Conclusion

This chapter has contextualised the current provision of school food in the state primary school sector in KSA, highlighting the extent to which it is shaped by the Kingdom’s distinctive nutrition environments. It has also critically evaluated the current process of inspection used in this system and the nutritional guidelines which it employs, contrasting this with equivalent nutritional standards and guidelines from the UK context, to identify some of the weaknesses within the Saudi framework. It also examined two previous interventions intended to improve children’s nutrition in the primary school setting and drew on these to provide insights into the reasons for the failure of these two initiatives. School food provision is important because it effectively controls the choices and access that children have to food in the nutritional environment of the school, a setting in which they spend a large percentage of their day. If children are to

learn how to make healthier food choices within the school environment, then the current system needs to undergo a significant transformation.

The next chapter examines the childhood obesity crisis in KSA, a major public health concern that is forcing the Saudi government to take the subject of children's nutrition very seriously.

3 Chapter Three: A Review of the Literature on the Childhood Obesity Crisis in KSA, its Causes and Consequences

3.1 Introduction

As this chapter will show, the prevalence of obesity, known to be a major contributor to many chronic diseases, is increasing in children and adolescents on a global scale. Obesity in the young is set to become a major healthcare burden in the western countries; in the Arab world, where young people make up a growing percentage of the population, childhood obesity has even more serious implications for public health. Over a third of the inhabitants of KSA are under the age of 16 (Collison et al., 2010), and since the 1990s, growing numbers of studies conducted in the Kingdom have reported a rise in the percentage of overweight and obese children and adolescents, a phenomenon which, as will be discussed here, has been linked with unhealthy dietary habits, sedentary behaviours and physical inactivity among this sector of the population. Increasing numbers of researchers have concluded their studies by calling for schools to take a more active role in promoting healthier eating and a more active lifestyle and reducing sedentary behaviours among this age group.

This literature review was mainly carried out using an online database search. Other information was sourced from statistics, policy documents and studies from the relevant Saudi Ministries, municipal authorities and official publications, many of which can now be accessed via the government portal (http://www.data.gov.sa). Although some of this KSA material is available in English, most was accessed in Arabic initially.

Keyword searches on relevant databases accessible via Manchester Metropolitan Library together with Google Scholar were used to identify review articles and meta-analyses concerning 'childhood obesity', 'school feeding/meals programmes' and 'dietary/nutrition interventions to prevent childhood obesity in a school setting' (globally, Middle Eastern Region, Gulf States and KSA). These reviews provided insights into key debates and issues and references from these were then followed up to find useful evidence-based research and case studies. A search was also carried out on the British Library EThOS to identify any doctoral studies carried out in this area to ensure this

thesis had a distinctive focus and approach and was not duplicating aspects of previous research.

This literature review begins by establishing the scope of the childhood obesity crisis in KSA and the reasons why this has become a major public health concern. It explores the risk factors and lifestyle characteristics within the Saudi nutrition environment which are believed to have contributed to its growth and the extent to which these factors differ from or are similar to those found in both the Western world and in other Arab countries. It concludes by indicating the existing gap in research in this field.

3.2 The broader context: 'globesity'

According to the World Health Organization (WHO, 2010), globally non-communicable diseases (NCDs) now cause the deaths of more people annually than all of the other causes combined. Since the start of the new millennium, reports from WHO (2002; 2004) have highlighted the fact that the most important risk factors affecting NCDs are tobacco use, high blood pressure, inadequate consumption of fruit and vegetables, lack of physical activity, high concentrations of cholesterol in the blood, and being overweight or obese (WHO, 2002). Epidemiological, clinical, and basic research have established the fact that these key risk factors have an important role to play in the etiology and pathogenesis of the main NCDs. This research has also emphasised the vital importance of nutrition and lifestyle, not only in maintaining levels of health and well being but also in substantially decreasing disease risks (WHO, 2004).

WHO has also pointed to the fact that since the 1990s, there has been a global obesity epidemic (which this organization has referred to as 'globesity'). Furthermore, it notes that contrary to conventional wisdom, this growth in obesity is not restricted solely to industrialised societies since WHO estimates that over 115 million people in developing countries also suffer from obesity-related problems (WHO, 2016).

Deitz (2004) asserts that conditions previously seen primarily in adults, such as type 2 diabetes mellitus, hypertension, and hypercholesterolemia, are becoming increasingly common among children and adolescents as a result of obesity. Moreover, given that obesity in childhood often persists into later life, growing numbers of adults will be at increased risk of developing these conditions in addition to certain types of cancer, cardiovascular disease and osteoarthritis

(Fontaine et al., 2003; Manson and Bassuk, 2003). The global obesity epidemic represents a substantial decrease in the quality of life of individuals and in their life expectancy and will account for an increasing proportion of national healthcare budgets (Katzmarzyk and Jenssen, 2004).

While there may be evidence that in some developed countries, the childhood obesity epidemic is stabilising after sharply increasing throughout the latter decades of the twentieth century (WHO, 2016), this trend is not reflected in the Arab world in general and in KSA in particular. In fact, the prevalence of childhood overweight and obesity in the Eastern Mediterranean Region (including the Gulf States) now exceeds that found in most European countries and is second only to the rates found in the USA (Kosti and Panagiotakos, 2006 cited in Habib-Mourad, 2013).

Table 3.1 Prevalence of overweight/obesity in adolescents in the Gulf States[14]

Study	Criteria used	Gender	Age (years)	Overweight %	Obesity %
Bahrain Gharib & Rasheed (2008)	IOTF*	M	10-18	22.7	12.7
		F		29.4	13.1
Kuwait El-Bayoumi et al. (2009)	IOTF	M	10-14	29.3	14.9
		F		32.1	14.2
Qatar Bener & Kamal (2005)	IOTF	M	10-18	27.5	7.1
		F		20.0	23.9
UAE Malik & Bakir (2006)	IOTF	M	14-17	32.3	13.3
		F		34.5	17.6

*IOTF = International Obesity Task Force (Source: Habib-Mourad, 2013)

3.3 Obesity in KSA

The context for this research, KSA, is often thought of as being unlike not only Western countries but also different from the surrounding countries in the region. In a number of respects, the Kingdom is indeed distinctive but in regards to obesity and to its impact on the health of Saudi citizens, it is following the same patterns as those seen across the globe and at regional level.

Well over a decade ago, WHO statistics were already recording over 50% of the population of the Gulf States as overweight as a result of poor eating habits, low levels of physical activity and sedentary behaviour (Rolando and Fuertes,

[14] The Gulf States, also sometimes referred to as the Gulf Cooperation Council (GCC) countries consist of Bahrain, KSA, Kuwait, Oman, Qatar and the United Arab Emirates. However, no comparable data was available for Oman.

2004). Table 3.2 provides an overview of some of the results from a Saudi Health Interview Survey jointly carried out in 2013 by the Saudi Ministry for Public Health and the Institute for Health Metrics and Evaluation at the University of Washington (Almarghalani and Stewart, 2013). It covered all 13 municipalities of the KSA and interviewed a representative sample of adults aged 15 and older about their health.

Table 3.2 Non-communicable diseases in KSA

CONDITION	FEMALE	MALE
Obesity (BMI over 30 kg/m^2)	33.5%	24.1%
Morbid obesity (BMI over 40 kg/m^2)	4.7%	2.5%
Diabetes mellitus[15]	11.7%	14.8%
Hypertension	12.5%	17.7%
Hypercholesterolemia	7.3%	9.5%

(Source: Almarghalani and Stewart, 2013)

Although obesity was previously identified as predominantly an adult health problem, it is increasingly becoming a concern among Saudi children and adolescents. Since the 1990s, multiple studies conducted in KSA have reported a high prevalence of overweight and obese children and adolescents. Table 3.3 gives an overview of rates of prevalence found in studies, drawing on three literature reviews of studies on obesity in childhood and adolescence in KSA, namely, Al-Dossary et al. (2010), Al Shehri et al. (2013) and Hammad and Berry (2016). As a point of comparison, the International Obesity Task Force reported in 2004 that 10% of the world's children could be considered overweight and 2-3% obese (Lobstein et al., 2004).

Hammad and Berry (2016) highlight the fact that the lack of consensus by researchers on the criteria for defining obesity poses problems when attempting to draw wholly meaningful comparisons between studies carried out in different periods or in different countries.

[15] Both types 1 and 2 of diabetes mellitus are found in KSA, and Madani (2000) observed patterns of chronic complications matching that of a rapidly industrialized nation.

Table 3.3 Reported prevalence rates of overweight/obesity in children/adolescents in KSA

AUTHOR/YEAR	PREVALENCE RATES OF OVERWEIGHT/OBESITY IN STUDY SAMPLE (GENDER, AGE, LOCATION)
Al-Nuaim (1996)	Overweight=11.7% obesity=15.8% M, aged 6-18, KSA
Abahussain et al. *(*1999)	Overweight and obesity(total sample) =29% F, aged 12-19 Al-Khobar, Eastern Province
Albakhail & Shawky (2002)	Overweight=13.4% obesity =13.5% M/f, aged 9-21, Jeddah
El Hazmi & Warsi (2002)	Overweight M=10.7% F=12.7% obesity M=6.0% F=6.7% M/F, aged 1-18, KSA
Al-Rukban (2003)	Overweight =13.8% obesity =20.5% M, aged12-20, Riyadh
Al-Almaie (2005)	Overweight M=19.3% F=11.8% Obesity: M=17.2% F=10.2% M/F, aged 14-19 Al Khobar, Eastern Province
Al Turki (2005)	Overweight=18.7% obesity=21% M/F, aged 12-20, Riyadh
Al-Hazzaa & Al-Rasheedi (2007)	Obesity (total sample) =10.8%. M/F, aged 3.4-6.4, Jeddah
Al-Saeed et al (2007)	Overweight=20% obesity =11% F, aged 6-17, Al-Khobar, Eastern Province
Al-Rowaily et al. (2007)	Obesity =4% M/f, aged4-8, Riyadh
Farghaly et al. (2007)	Obesity=15.9% overweight=11% M/F, aged 8-18, Abha Overweight =11% obesity =15.9% M/F, aged 7-20, Abha
Alam (2008)	Obesity =14.9% F, aged 8-12, West Riyadh
Amin et al. (2008)	Obesity =14.9% M, aged 10-14, Al Hassa
Mahfouz et al. (2008)	Obesity =5% overweight =11% M, aged 11-19, Abha
Al-Dossary et al. (2010)	Overweight =19% obesity =23% M/F, aged 2-18, Eastern Province
Collison et al. (2010)	Overweight=12.2% obesity=27.0% M/F, aged 10-19, KSA
El Mouzan et al. (2010)	Prevalence in all age groups of overweight=23.1%, obesity=9.3%, morbid obesity =2% M/F, aged 5-18, KSA
Al Shehri et al. (2013)	Schoolchildren overweight =23% obesity =9.3% Preschool children overweight =15% obesity =6% Literature review 2000-2012

In their overview of 14 studies covering age groups 2-20 year-olds which had evaluated the prevalence of overweight and obesity Al-Dossary et al. (2010: 1003) concluded that obesity in Saudi children was "a dangerous reality**"** and

that although the prevalence varied in its quantity between provinces, this phenomenon was now present in every part of the Kingdom, whether rural or urban. Al-Dossary et al. (2010) found that the Eastern province had the highest rates of obesity and the Southern province the lowest in the kingdom.

One of the most striking statistics which Al-Dossary et al. (2010) report comes from Al-Hazzaa and Al-Rasheedi's (2007) study of Riyadhi primary schools in which measurements relating to weight collected from a sample of children in 1988 were compared with a sample of their 2005 counterparts. Their results suggest that in the space of less than two decades, the percentage of obese male children in the age group 6-14 year olds had increased from 3.4% to 24.5%. Elsewhere in the Arab world, Khan (2006) notes that in Morocco, the percentage of overweight children (male and female) tripled in a similar timeframe (1987-2004) from 2.7% to 9.2 %.

In their reviews of regional and national studies published in the period from 2000 to 2012 looking at obesity among Saudi children, Al Shehri et al. (2013) found that all studies showed a trend towards increasing obesity over time. The authors also pointed to the particularly worrying statistics concerning the prevalence of overweight and obesity in pre-school children of 15% and 6% respectively, and highlighted the need for "a national strategy […] to treat and prevent this serious health problem" (Al Shehri et al., 2013: 9).

The most recent systematic literature review by Hammad and Berry (2016: 8) focusing on the child obesity epidemic in KSA, which covered research conducted from 2003 to early 2016, concluded that "Childhood obesity is increasing in Saudi Arabia at an alarming rate". Table 3.4 provides an overview of selected studies and findings on obesity in children and adolescents in KSA based on Al-Dossary et al. (2010), Al Shehri et al. (2013) and Hammad and Berry (2016).

Table 3.4 Selected studies and findings on obesity in children and adolescents in KSA

AUTHOR/YEAR	FOCUS	SAMPLE (*N*) GENDER (M/F) AGE	LOCATION	MAIN FINDINGS
Abahussain et al. *(*1999)	Nutritional status of adolescents (F)	*N*=676 F only 12-19	Al-Khobar, Eastern Province	Overall prevalence of overweight and obesity=29%
Albakhail & Shawky (2002)	Relationship between self-reported weight/ height and actual weight/height in children and adolescents	*N*=2860 M=42%/F=42% 9-21	Jeddah	Prevalence of overweight=13.4% obesity =13.5% Over half of participants unaware of weight/height, showing inaccuracy of self-reported weight/height in tracking obesity in these age groups
Abhakhail (2002)	Comparison of levels of overweight and obesity in Ministry of Education surveys 1994 and 2000	*N*=2708 (1994) *N*=2542 (2000) M/F 10-20	KSA	BMI increased from 1994 to2000,
Al Alwan et al. (2013)	Influence of parental education and economic status on obesity in children	*N* =1,243 F=56.4%; M=43.6% 6-16	KSA	Association found between overweight or obese KSA children and mother's education level and family income.
Al-Almaie (2005)	Identifying prevalence of overweight and obesity using two international standards	*N*=1,766 F=61.8%; M=38.2% 14-19	Al Khobar, Eastern Province	Prevalence of overweight M=19.3% F=11.8% Prevalence of obesity: M=17.2% F=10.2%
Alam (2008)	Prevalence of obesity among primary school students (F) and obesity-associated risk factors.	*N* =1,072 F only 8-12	West Riyadh	Prevalence of obesity =14.9% 95% of obese students lived in large houses; commonly consumed fast food and soft drinks. 97.5% of obese students viewed TV daily
Al-Daghri et al. (2010)	Association of sagittal abdominal diameter with obesity measures.	*N* =964 prepubertal *n*=365	KSA	Sagittal abdominal diameter was correlated with indices of obesity regardless of gender. Association found to be stronger among pubertal males than females.

AUTHOR/YEAR	FOCUS	SAMPLE (*N*) GENDER (M/F) AGE	LOCATION	MAIN FINDINGS
		F=60%; M=40% pubertal *n*=249 F=49.8% M=50.2% postpubertal *n* =350 F=43.4%; M=56.6% 5-17		
Al-Dossary et al. (2010)	Prevalence of overweight and obesity in children and adolescents.	*N* =7,056 school *n*=1,260 private hospital *n*=5,796 M/F 2-18	Eastern province	Prevalence of overweight =19% obesity =23% Obesity by gender 14–18 year-olds M =35.6% F=19.2% Over half of 14-18 year-olds had weight above the 85th percentile. Obesity by age: preschool (M/F) =31% adolescents(M/F) =76%
Al-Ghamdi (2013)	Association between TV viewing and obesity in KSA children, calculated by BMI.	*N*=397 F=49.4%; M=50.6% 9-14	KSA	TV viewing reported as a risk factor for obesity in KSA children ($p < .001$).
Al-Hazzaa (2007)	Comparative review of prevalence and trends in obesity amongst school boys using studies from 1988 and 2005	*N*=1082 (1988) *N*=2102 (2005) M only 6-14	Riyadh	Obesity prevalence: 3.4% (1988) 24.5% (2005)
Al-Hazzaa & Al-Rasheedi (2007)	Association between levels of adiposity and physical activity.	*N*=224 F=51.3%; M=48.7% 3.4-6.4	Jeddah	Prevalence of obesity (total sample) =10.8%. Gender differences in fat percentages and counted steps per day was significant ($p < .05$).
Al-Hazzaa et al	Physical activity, sedentary behaviours (TV	*N*=2908	Al-Khobar,	More than 2 hrs screen time/day M=84% F=91.2%

AUTHOR/YEAR	FOCUS	SAMPLE (*N*) GENDER (M/F) AGE	LOCATION	MAIN FINDINGS
(2011)	viewing, playing video games and computer use), and dietary habits among Saudi adolescents relative to age, gender and region	M=1401 F=1507 Ages:14-19	Jeddah and Riyadh	Failure to meet daily physical activity guidelines: M=50% F=75% Most adolescents did not consume breakfast, fruit, vegetables and milk daily. Females were significantly ($p < 0.05$) more sedentary, less physically active, and significantly ($p < 0.05$) higher intake of chips, crisps, cakes, donuts, sweets and chocolate.
Amin et al. (2008)	Association between obesity/overweight and dietary habits and sociodemographic differences.	*N*=1139 M only 10-14	Al Hassa	Prevalence of obesity =14.9% Overweight/obesity more prevalent in urban, older students; mothers of obese/overweight were less well educated and more frequently working mothers.
Al-Muammar et al. (2014)	Association between lifestyle and eating patterns and measured BMI.	*N*=107 F only 12-15	KSA	No significant differences found between BMI category and eating patterns.
Amr et al. (2012)	BMI distribution among adolescent females. Identified the relationship between obesity and symptoms of puberty.	*N*=200 F only 12-20	KSA	Mean BMI of obese group =34.4 ± 4.9 kg/m2. Statistically significant differences between obesity and menstrual irregularity ($p < .05$)
Al-Nakeeb et al. (2012)	Comparison of weight status and patterns of physical activity by gender and age in UK and KSA.	*N*=2,290 M/F 15-17	KSA/UK	Differences in percentages of overweight, obesity and levels of physical activity were evident between two countries.
Al-Nuaim et al. (1996)	Patterns of growth and obesity in school children (M)	*N*=9061 M only 6-18	KSA	Prevalence of overweight=11.7% obesity=15.8%
Al-Rowaily et al. (2007)	Comparative study of KSA anthropometric data and. international studies (WHO)	*N*=6,207 M/F 4-8	Riyadh	Prevalence of obesity =4% underweight =5.8% stunted growth=5.9% weight/height measurements for KSA close to WHO standards
Al-Rukban (2003)	Prevalence of overweight and obesity. Evaluated participants' knowledge	*N*=894 M only	Riyadh	Prevalence of overweight =13.8% obesity =20.5% Some 20% of overweight participants did not think they

AUTHOR/YEAR	FOCUS	SAMPLE (*N*) GENDER (M/F) AGE	LOCATION	MAIN FINDINGS
	of/attitudes toward obesity.	12-20		were overweight.
Al-Saeed et al (2007)	Prevalence and socioeconomic risk factors associated with obesity.	*N*=2,239 F only 6-17	Al-Khobar, Eastern Province	Prevalence of overweight=20% obesity =11% Overweight was higher among students with self-employed fathers ($p < .01$) and highly educated mothers ($p = .008$).
Al-Shehri et al. (2006)	Evaluated the appropriateness of the NCHS growth standards as a measurement for KSA children. Aimed to standardize growth parameters for KSA children living in high-altitude city.	*N*=13,580 F=47%; M=53% 3-18	Al-Hada, Taif	Utilization of the NCHS growth standard found to be an unsuitable method of growth measurement for children living in high-altitude areas in KSA.
Al Turki (2005)	Weight status of attendees at primary care clinics, King Khalid University Hospital	*N*=167 M/F 12-20	Riyadh	Prevalence of overweight=18.7% Prevalence of obesity=21%
Collison et al. (2010)	Association between sugar-sweetened carbonated beverage (SSCB) intake and BMI, waist circumference and poor dietary choices in children/adolescents	*N*=9,433 M=5033 F=4400 10-19	KSA	Prevalence of overweight=12.2% obesity=27.0% M obesity rates higher than F ($p \leq .001$). Waist circumference and BMI positively correlated with SSCB intake (M only). Higher intake of SSCB is associated with poor dietary choices.
Darwish et al. (2014)	Lifestyle and dietary behaviours in KSA preschool children.	*N*=300 F=54.3%; M=45.7% 1-5	KSA	Frequent consumption of pizza, burgers, biscuits, chocolate, chips, and soft drinks reported among the sample.
El Hazmi & Warsi (2002)	Prevalence rates of obesity and overweight in KSA infants, children and adolescents.	*N*=12,701 M/F 1-18	KSA	Prevalence of overweight 23.4% M=10.7% F=12.7% obesity 12.7%M=6.0% F=6.7%
El Mouzan et al. (2010)	Prevalence of overweight and obesity in KSA children and adolescents.	*N*=19,317 F=49.2%; M=50.8%	KSA	Prevalence in all age groups of overweight=23.1%,, obesity=9.3%, morbid obesity =2%

AUTHOR/YEAR	FOCUS	SAMPLE (*N*) GENDER (M/F) AGE	LOCATION	MAIN FINDINGS
		5-18		
Farghaly et al. (2007)	Lifestyle and dietary habits of school students and the prevalence of nutritional problems.	*N*=767 M/F 7-20	Abha	Diets rich in carbohydrates and deficient in fibre; fast food consumed 2.0 ± 1.7 times/month. Breakfast regularly eaten by 72% of primary students vs. 49% of secondary school students; daily milk intake by 51.5% of sample. M took significantly longer physical exercise than F. Prevalence of Underweight =18.9% obesity=15.9% overweight=11% overweight and obesity rates significantly more prevalent among F
Khalid (2008)	Identified specific at-risk groups for childhood overweight and obesity in high-/low-altitude rural areas in KSA populations.	=912 M/F 6-15	KSA	Moderate-to-high parental income, age ≥10 years, female gender, high-altitude birth/residence were significant independent predictors of childhood overweight and obesity
Mahfouz (2008)	Obesity and related behaviours among adolescent school boys	*N*=2696 M 11-19	Abha	Prevalence of obesity =5% overweight =11%
Mahfouz et al. (2011)	Gender differences in obesity and related behaviour among adolescents	*N*=1,249 M/F 11-19	Al-Hassa, Eastern Province	Prevalence of obesity/overweight by gender: M=23.2% ; F=29.4%

Source: compiled from Al-Dossary et al. (2010), Al Shehri et al. (2013) and Hammad and Berry (2016).

Given that KSA, like many of the Gulf States, is demographically a young society (see Figure 3.1), statistical trends of this kind can be said to represent a 'ticking time bomb' with potentially staggering implications for "health, quality of life, productivity and healthcare costs" (Popkin et al., 2012).

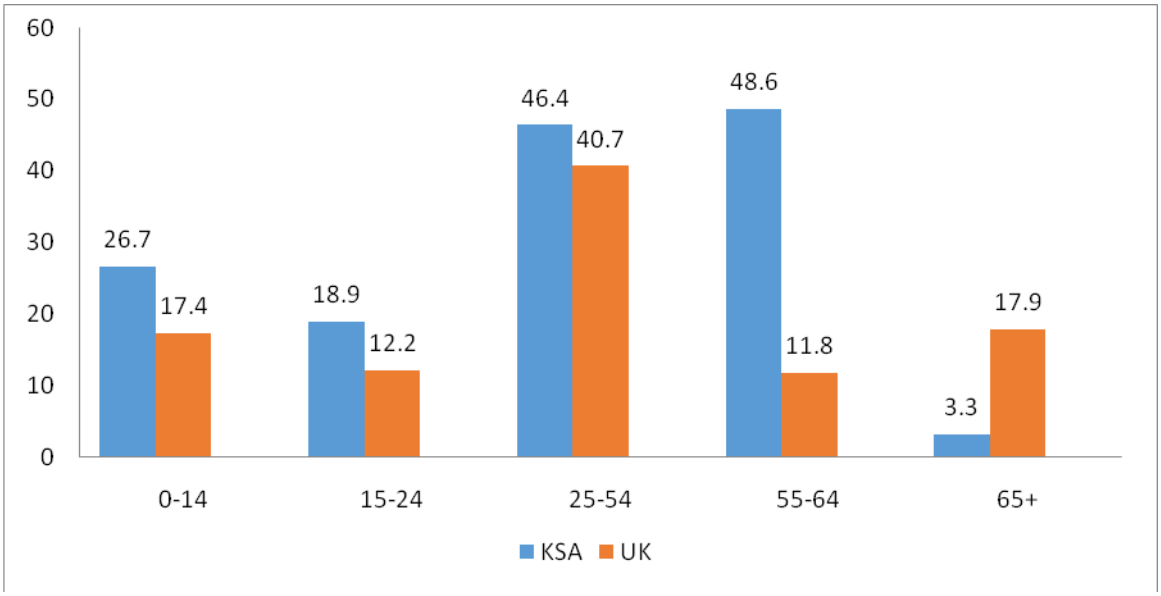

Figure 3.1 Age distribution of population: KSA vs. UK
(Compiled from www.indexmundi.com)

According to the WHO, the health consequences of obesity for children and adolescents can be both short-term and long-term. In the short term, they may develop type 2 diabetes, sleep apnoea, and non-alcoholic fatty liver disease (WHO, 2008). Being overweight in childhood can also have psychosocial consequences as a result of stigmatization, affecting self-esteem and leading to negative consequences on both social and cognitive development (Hesketh et al., 2004; Must and Strauss, 1999).

Childhood obesity has also been found to be an important determinant of adult health, as 60% of pre-pubescent children who are overweight go on to retain this status in their early adult life. Moreover, since a child's cardiovascular and metabolic health profiles are often retained into adulthood, this can mean an elevated risk of developing non-communicable diseases at an earlier age and, ultimately, of premature death (WHO, 2008).

All this highlights the urgent need for interventions to reduce and reverse this obesity epidemic and limit its possible health hazards in order to prevent grave repercussions as this sector of the Saudi population grows into adulthood.

3.4 The nutrition transition in KSA

As al Hazzaa (2002:12) observes, like many other countries in the Arab world, Saudi society is experiencing “a nutrition transition”, a term originally coined by Popkin (2002). He used this in his model that explains how historic demographic and epidemiological transitions have also been accompanied by changes in the human diet and levels of individual physical activity. These in turn have resulted in nutritional outcomes such as changes in body composition and stature, forming part of the nutrition transition. He later developed this concept to produce a five-stage nutrition transition model (Popkin, 2006). The final three patterns or stages of this model (Figure 3.2) are most relevant to this discussion.

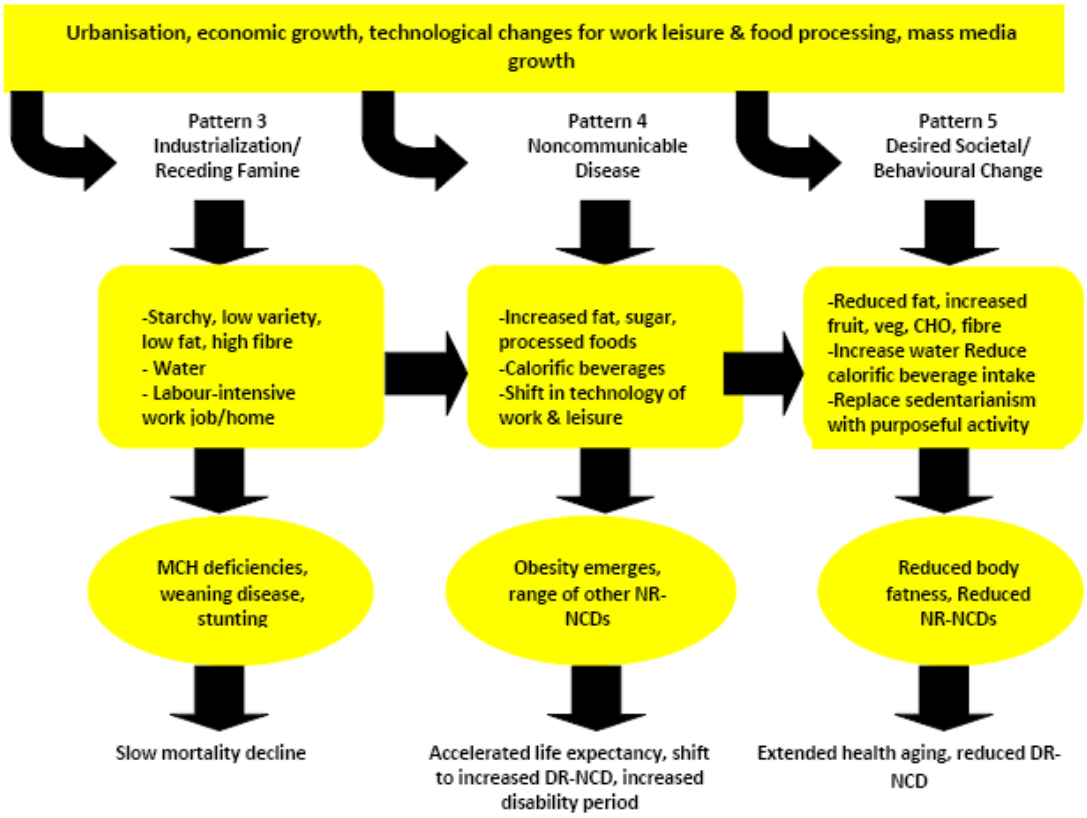

Figure 3.2 Nutrition transition: patterns 3-5 (adapted from Popkin et al., 2012)

Popkin’s model suggests that while the nutrition transition from industrialization (pattern 3) to the current pattern (pattern 5) occurred over the space of some two centuries in the Western countries, this massive shift has taken place within just a few decades in those countries that have gone through a rapid development process, such as KSA. According to Popkin, the key dietary changes have been increased global production, supply and consumption of vegetable fats (Drewnowski and Popkin, 1997); a large increase in the intake of

caloric sweeteners, particularly in drinks (Popkin and Nielsen, 2003) and the rise in demand for and production of meat, milk, fish and eggs (Popkin and Du, 2003).

As noted previously (section 2.3), although Islamic beliefs and practices still continue to influence eating habits and food choices, other patterns of food consumption have changed radically in the region during the past three decades. The traditional Bedouin cuisine of whole grains and pulses with small quantities of meat (and fish in the coastal regions) formerly found in all parts of the Arabian Gulf peninsula (Salloum, 2006) has been largely replaced by a Westernised diet.

In his overview of the key factors which have been identified as having contributed to the global epidemic of obesity, Caballero (2007) begins by noting that the increased calorie intake which has been linked to this phenomenon, is related not only to the volume of foodstuffs consumed, but also to their composition and quality. With regards to the former, from the 1970s onwards, the price of food in KSA decreased substantially relative to people's income, meaning it became more affordable to larger numbers of the population than was previously the case (Magbool, 1994). In addition, from the 1980s onwards, the intake of animal products, saturated fats and refined sugar in the Saudi diet began to increase (Abalkhail, 2002). Whereas dates would previously have constituted the sweet treat of choice for Saudis, eaten with tea or coffee, snacking on calorie-dense foods, including confectionery and crisps, is now much more prevalent, while sugar-sweetened carbonated drinks are accessible to most Saudi children and adolescents (Musaiger, 2011).

Al-Hazzaa et al.'s (2011) study of the dietary habits of Saudi adolescents (14-19 year-olds) found that 31% of females and 41% of males drank sugar-sweetened beverages every day. The same study found that sweets and chocolate were consumed more than three times per week by 37.3% of males and 52.6% of females. This intake of confectionery among females was reported to be significantly higher than that among their male counterparts, while energy drinks were much more popular with males than females (Al-Hazzaa et al., 2011). One of the results of this high consumption of sugar can be seen in the high prevalence of dental caries amongst the young in the Kingdom (Farghaly et al. 2007; Togoo et al., 2012). The Ministry of Education's own lifestyle study in

2004 reported that 59% of students who regularly consumed soft drinks with fast food reported suffering from tooth decay (Ministry of Education, 2004).

As in contemporary Western diets, the intake of fruit and vegetables and consequently fibre remains low in the Saudi diet (Abalkhail et al., 2002). According to Farghaly et al. (2007) on average Saudi adolescents consume just three servings a week of vegetables, making this the least frequently eaten of the major food items. More recently, the Saudi Health Interview Survey carried out in 2013 found that only 7.6% of adults consumed more than the recommended five daily servings of vegetables and fruits (Almarghalani and Stewart, 2013). This compares with about 15% of UK adults according to the British Dietetic Association (BDA, 2014).

Finally, over the course of the past three decades, consumption of milk and complex carbohydrates has decreased in the Saudi diet (Musaiger, 2011). At the same time, as in most countries of the Eastern Mediterranean Region, there has been a gradual and significant rise in per capita consumption of animal protein, fat and refined carbohydrates *(*Sibai et al., 2010). The major sources of carbohydrate currently consumed tend to be heavily processed and refined: white bread (as opposed to the traditional unleavened wholemeal flatbread which made up a staple part of the Bedouin diet), white rice, canned fruit juice, sweetened beverages, sweets, and biscuits (Musaiger, 2011).

3.5 The rise of fast food in the nutrition environment of communities

Another significant shift which has occurred in Saudi society and one which commonly takes place in developing countries as they industrialise is the change in attitudes towards food. As a result, food is no longer seen purely in terms of the nourishment necessary for survival but is increasingly viewed as a source of pleasure and as a marker of individual lifestyle choices (Magbool, 1994). Consuming Western branded foodstuffs reflects a desire to be considered more modern and cosmopolitan in outlook (Magbool, 1994). Persuasive marketing is often highly influential in encouraging the purchasing of these foods (Khan, 2006).

The introduction of Westernized fast-food chains has also added to the growing obesity epidemic (Astrup et al., 2008). Major multinational fast-food franchises such as McDonalds, Burger King, Pizza Hut, Subway, and Dunkin Donuts began to appear in urban centres of KSA in the early 1990s. The variety and

availability of fast foods in KSA has increased vastly since the late 1990s and it has become a very popular, almost indispensable, component of everyday life for those in the younger age groups (Al Ghamdi, 2009). Western companies have more recently been followed by national brands such as Al-Baik, Shawerma Joha, Herfy and Kudu (Naeem, 2012).

According to Euromonitor International, which is the global leader in independent strategic market research, in 2014 the fast-food sector in KSA generated sales of 21.2 billion riyals, experiencing a 10% growth in value over the course of one year (Euromonitor, 2015). The Euromonitor market report notes that this growth in sales is being driven largely by increasingly busy lifestyles, with consumers relying on fast food as a quick meal solution, especially during lunchtime. In addition, rising disposable income levels as a result of recent Saudi government initiatives have enabled a broader range of consumers to buy fast food on a more regular basis. Finally, and perhaps most significantly in this context, this rise reflects the increasing numbers of young people within the Saudi population for whom fast food is viewed as a popular and affordable option, with most meal deals with chips and a soft drink costing around 15–20 riyals (£3.00-4.00) (Naeem, 2012). This use of smart pricing strategies also means that fast food is affordable to even the lower socioeconomic classes in Saudi society.

Naeem (2012) notes that such popular fast food meal combinations contain high levels of white flour, refined sugar, saturated fats and sodium and numerous food additives but are low in protein and fibre, containing virtually no fruit or vegetables. In addition to the excess energy intake such food represents due to large portion sizes, it also has major nutritional limitations including low levels of minerals, vitamins and nutrients such as omega-3 fatty acids, folate, riboflavin, vitamin A and calcium, unless milk is consumed as part of the order. However, it is typically accompanied by sugar-loaded beverages (Astrup et al., 2008).

In their study of Saudi adolescents, Al-Hazzaa et al. (2011) found that 30.2% males and 24.9% females reported that they consumed fast food more than three times per week. This was actually lower than the intake of fast food reported for their Emirati counterparts (bin Zaal et al., 2009). Some studies have reported much lower levels of fast food consumption, for example, according to

Farghaly et al. (2007) adolescent students in Abha reported that they only ate fast food twice a month. The authors argue that this may reflect the lower prevalence of fast food outlets outside the main urban centres. Al-Rowaily et al. (2007) found that in some areas of KSA the population had healthy growth characteristics typical of less urbanised communities and thought this might be linked to localised restrictions on situating fast-food shops in residential areas. However, the introduction of online ordering and delivery options via mobile apps may bring about changes in the community nutritional environment.

3.6 Lifestyle changes

Rapid economic development resulting from the oil boom, together with subsequent modernization and urbanization in recent decades, have not only changed nutritional habits in KSA but have also led to massive transformations in Saudi lifestyles (El-Hazmi and Warsy, 2001). Huge advances in technology and higher living standards and related environmental determinants have to a great extent systematically reduced levels of physical activity allied to increased patterns of sedentary behaviour leading to reduced total energy expenditure in the Saudi population (Al-Rukban, 2003).

3.6.1 Physical activity

There has been growing concern in western countries about decreasing levels of physical activity in school-age children while levels of obesity in this group are rising (Department of Health, 2011; Fulton et al., 2011; Juan et al., 2010; Slingerland et al., 2012). The cause and effect relationship between levels of obesity and physical activity has been debated and it remains unclear whether children and young people gain weight because they are not taking sufficient physical activity or whether overweight children and young people do not engage in physical activity because they find it difficult to exercise for multiple reasons. Obese children suffer more musculoskeletal problems than their normal-weight counterparts and when they attempt sustained exercise their excess body mass results in poorer performance during creating a vicious circle (Habib-Mourad, 2013). It has also been suggested that overweight children are more likely to feel embarrassed about taking part in team sports, and to demonstrate lower levels of confidence when attempting to overcome barriers to physical activity (Habib-Mourad, 2013).

Research indicates that boys participation in physical activities tends to more frequent and of a higher intensity than that of their female counterparts in both developed and developing countries (Sallis et al., 2000; Grunbaum et al., 2004; Taymoori et al., 2008). Researchers have pointed to the influence of cultural factors in addition to the type of activities offered since competitive sports are often emphasised at school whereas girls may prefer fitness or dance classes (Habib-Mourad, 2013).

Given that it is generally agreed that physical activity has significant health benefits for children and adolescents (Janssen and LeBlanc, 2010), nations around the world have initiated policies aimed at increasing physical activity levels in order to improve health and well-being (World Health Organization, 2014).

As elsewhere, there are growing concerns about declining levels of physical activity amongst school-age children and young people. Levels of physical activity in school-age children, particularly those in secondary school, have been found to be rapidly decreasing in KSA, particularly in girls and adolescent boys (Al-Refaee and Al-Hazzaa, 2001; Mahfouz et al., 2008; Al-Hazzaa et al., 2013; 2014). Levels for Saudi male adolescents not meeting recommended daily physical activity levels, for example, have been reported in various studies at 43 per cent (Al-Refaee and Al-Hazzaa, 2001), 48 per cent (Al-Rukban, 2003) and most recently 60 per cent (Al-Hazzaa et al., 2014). Health professionals agree that this constitutes a major social and health problem that needs to be addressed urgently by government officials and policymakers (Al-Hazzaa et al., 2013; Mahfouz et al., 2008; Mostafa and Khashaba, 2011). Moreover, recent studies have also identified that physically inactive young people, whether male or female, are also more likely to adopt unhealthy dietary habits, consuming more fast food and less fruit and vegetables (Al-Hazzaa et al., 2014; Al Muammar and El Shafie, 2014) (see section 3.7 on clustering of obesity factors).

Various factors have been proposed for these low levels of physical activity amongst children and adolescents in Saudi society. Research from developed countries has pointed to linkages between the built environment, physical activity, and levels of obesity since children in urban areas are discouraged from taking part in spontaneous physical activity as part of play. Concerns about

safety and long distances between where children live and the schools they attend can also act a major barrier to what is referred to as 'active transport', meaning cycling or walking to and from school (Frank et al., 2006; Hesketh et al., 2005). In the case of KSA, cultural and socio-economic factors mean that students of all ages are invariably driven to school since public transport is often not available or inaccessible, most households have access to a private motor vehicle, and there is a perceived lack of safe and secure walkways (Alshmaly, 2006). Participants in studies focusing on young Saudi males have cited lack of time due to study or family commitments (Al-Hazzaa et al., 2014). They also mention lack of facilities as the primary reason for their inactivity (Alahmad, 2016). In addition, increasing amounts of screen time is another major contributing factor (Al-Hazzaa et al., 2014) (see section 3.6.2).

When it was established by the Saudi government in 1974, the General Presidency of Youth Welfare proposed a number of policies for increasing levels of physical activity and sport participation among male adolescents[16] including:

- Establishing sport facilities and expanding recreational programmes in all Saudi cities.
- Encouraging private sector participation to build sport centres and recreational spaces (Alahmad, 2016).

However, for a number of reasons including a lack of resources and poor coordination amongst central and local government ministries and agencies, these policies have failed to deliver on their promises to increase participation in physical activity and sport (Alkmies, 2010). As a result, the type of community sports and leisure centres commonly found in developed nations to encourage physical activity and mass participation sport do not exist in KSA (Alahmad, 2016). Free facilities for physical activity are scarce and private sports clubs charge high membership rates. If sport is offered as an extra-curricular activity, students wishing to attend are usually required to pay an extra fee. Sports programmes and competitions for young people are poorly organised, especially in more disadvantaged communities (Alkmies, 2010). KSA's *Vision*

[16] At the time of writing, there is no female section of this government agency although this is likely to change if government policy shifts.

2030 recognises past problems by stating “Opportunities for the regular practice of sports have often been limited. This will change”.

Research suggests that if an individual enjoys physical activity at school this can carry all the way over to adulthood (Alahmad, 2016). The physical education curriculum in particular can play a crucial role in promoting activity while other school-based interventions can encourage exercise for both girls and boys taken during recreation time and after school (Habib-Mourad, 2013). However, currently, the Saudi education system is largely failing to engage the two groups most likely to have low levels of physical activity, namely, girls and male adolescents.

In KSA, the gender-differentiated policy followed by the Ministry of Education means that the physical education program has traditionally only been offered to male students, although some private schools have been offering physical education for girls since they first opened, together with extra-curricular physical activities (Human Rights Watch, 2012). In April 2014, the Saudi *Shura* Council (the advisory body to the King) directed the Ministry of Education to study the possibility of introducing mandatory physical education in all state schools for girls throughout the years of compulsory education in compliance with Shari’a rules on dress and gender segregation. Saudi researchers have also explicitly supported the introduction of this change to address current concerns about level of physical activity among females in the Kingdom (for example, Bakr et al., 2016). Saudi women have among the highest levels of physical inactivity among females globally and a study examining adult physical inactivity prevalence in 38 Muslim countries (Kahan, 2015), placed Saudi females with the second highest level (73.1%).

In the case of male students, physical education class time decreases as they progress through their schooling. In primary school, two 90-minute sessions per week are allocated to physical education; however, for students in middle and secondary school years, this is reduced to one 45-minute class per week. In a recent study of physical education in boys’ secondary schools in Riyadh, Alahmad (2016) found that 43% of the male adolescent respondents surveyed said that the institution they attended did not have any facilities for sport or physical activities. Moreover, in the private sector, the school may place a major focus on academic achievements, prompting schools to reduce break-times and

physical education classes for students so that the academic curriculum is not affected.

3.6.2 Sedentary behaviours

Research focusing on KSA indicates that over the last three decades the sedentary lifestyle of the general population is increasing and along with it the rates of preventable conditions such as heart disease and diabetes (Al-Hazzaa et al., 2014; Mostafa and Khashaba, 2011). The type of sedentary lifestyles such as watching TV and playing computer games which are associated with low levels of physical fitness are becoming increasingly prevalent among children and young people in KSA. This increased screen time (al Hazzaa et al., 2002) has also been marked as contributing to obesity (Madani, 2000) since it reduces energy requirements without an equivalent change in intake (Al-Hazzaa, 2002). More recently, Al-Hazzaa et al. (2011: 10) found that the prevalence rate of screen time (i.e. the combined time spent viewing TV, playing video games and using the computer) among Saudi adolescents is now comparable with rates found in adolescents in North America. Al-Hazzaa et al. (2011: 5) found that adolescent Saudi females are at greater risk of physical inactivity and sedentary behaviours. In short, girls in KSA were more likely to exercise less and eat more.

3.6.3 The “obesogenic environment”

Examining the key factors which have been linked to global obesity trends, Caballero (2007: 3) points to the creation in recent decades of what he calls the “obesogenic environment” which has greatly impacted on influencing energy intake and output. In addition to the rise in dependency on ready-made foods and the pervasive presence of food outlets on the high street serving fast, energy-dense foods (as discussed previously), Caballero also notes how some types of urban planning can restrict opportunities for walking, promote car use and increase the need for lengthy daily commutes.

Before the major surge in economic growth in KSA, which started in the 1980s, traditionally designed neighbourhoods in the Kingdom’s major cities provided opportunities for walking and cycling as a part of everyday life thus encouraging physical activity; previously, for example, it was common for children and adolescents to make their way to and from school on foot or by bicycle

(Alshmaly, 2006). In contrast, all of KSA's major cities are now designed in a modern style, which means that commercial and residential areas are separately zoned and then linked together by major road networks. Urban design of this type actively discourages walking and means that journeys tend to be made by car (Al-Hazzaa et al., 2011).

Hammad and Berry (2016) also highlight the fact that the dramatic increase in wealth experienced by many middle class Saudis from 1980s onwards has given them easy access to migrant workers in the home. Typically, cooks and maids are employed to take responsibility for all domestic chores, such as food preparation and cleaning, while many families also employ drivers. Studies suggest that this reliance by family members on domestic help may also have contributed to a more sedentary lifestyle (Alyaemni et al., 2013; Badran and Laher, 2012).

3.7 The clustering effect of obesity factors

The causes of obesity as frequently encountered in Saudi children and adolescents are multi-factorial (AlGhamdi, 2009) and certain unhealthy behaviours appear to aggregate among adolescents (Al-Hazzaa et al., 2011). This clustering effect appears to apply to both healthy and unhealthy lifestyle habits (Al-Hazzaa et al., 2011). Al-Hazzaa et al. (2011) found similar results to those indicated by Pearson and Biddle (2011) in their systematic review of studies concerning clustering effects in relation to obesity. Al-Hazzaa et al. (2011) concluded that sedentary behaviours (measured by total screen time) were closely associated with higher consumption rates of sugar-sweetened drinks, fast food and energy-dense snacks, and with lower intake of fruit and vegetables. Thus a high level of screen time exhibited a significant positive relationship with the intake of fast food, crisps and chips, cakes, doughnuts, sweets and chocolate, and with energy drinks (males) or sugar-sweetened beverages (females). The strength of this correlation was higher in female adolescents than in males.

A further factor which often co-occurs in children and adolescents with the risk of becoming overweight or obese is the failure to consume breakfast. Niklas et al. (2001) argued that consuming breakfast on a regular basis may help to control body weight because it plays a role in minimizing the intake of high-energy snacks and thus decreases the level of fat in the diet. They also

reported a correlation between children who eat breakfast and a larger intake of dairy products, fruit, and grains.

There is evidence that breakfast skipping by young adults is frequent in Western countries. For example, Rampersaud et al.'s (2005) study of American adolescents found that consumption of breakfast during the school years was linked to a 30% lower chance of becoming obese or overweight at a later age. Skipping breakfast has also been associated with unhealthy dietary habits playing a role in the development of obesity amongst European adolescents (Croezen et al., 2009). In the context of groups in nutrition transition, Hanley et al. (2000) found that skipping breakfast was positively associated with being overweight among children and young adults from indigenous Canadian communities. Faced by growing childhood obesity rates, the Mexican government opted to provide a nutritionally balanced breakfast for more than five million children across the nation on the basis of available evidence (WHO, 2013).

As noted in Chapter Two, due to the early start of classes, Saudi schoolchildren often do not have the appetite for breakfast before going to school or lack the time to eat this. Abalkhail and Shawky (2002) reported that 15% of secondary school students in Jeddah claimed not to eat breakfast, whilst in its 2004 lifestyle study, the Ministry of Education reported that 35% of the students surveyed did not usually take breakfast before coming to school (Ministry of Education, 2004). A more recent study by Farghaly et al. (2007) of male and female students in Abha suggests that the tendency to skip breakfast may be age-related since they found that whilst 72% of primary school students regularly ate breakfast, only 49% of their secondary school counterparts did so. Bin Zaal et al. (2009) found that in the United Arab Emirates, about 10% of male and 19% of female adolescents admitted to missing breakfast. Farghaly et al. (2007) only observed a significant difference between male and female students in relation to skipping breakfast during intermediate grade.

Al-Othaimeen et al.'s (1999) study of primary school girls in Riyadh was principally focused on anaemia (a particular problem in KSA)[17] but also found

[17] For reasons which are not fully understood, anaemia is a major public health problem in KSA, particularly amongst females, and can create serious developmental problems such as stunted growth and wasting (Abou-Zeid et al., 2006). Studies have found a high incidence of iron-deficiency anaemia (HB<12g/dl) among Saudi

that 16.5% of the schoolgirl respondents did not eat breakfast at home. More interestingly in this context, these respondents noted that they relied on snacks from the school canteen as a substitute for breakfast and they listed biscuits, chocolate bars, crisps and carbonated soft drinks as typical foodstuffs consumed. Under current school canteen regulation, the last three of these items are now banned (see section 2.4.7). Findings of this type illustrate not only how the lack of breakfast is likely to lead to mid-morning snacking on food which are high in calories and poor in nutritional content but they also indicate the vital role which the school canteen plays in the daily diet of Saudi's schoolchildren for macro and micro nutrient intake.

It is not surprising then that Farghaly et al. (2007: 418) recommended the introduction of a subsidized school breakfast programme which would provide "appropriate amount of calories, milk, and special nutrients." They argued, furthermore, that if such programmes were not thought to be appropriate or applicable "a firm policy and close supervision over food items sold to our students should be urgently and strictly implemented" (Farghaly et al., 2007:419) and that junk food, soft drinks, crisps, and sweets should no longer be on sale in school canteens.

In their study of the relationship between excess weight/obesity, dietary habits and socio-demographic characteristics among boys at primary school in Al-Hassa, Amin et al. (2008) identified the following cluster of characteristics amongst students identified as overweight/obese. With regards to their dietary habits, this group of students rarely ate breakfast at home and frequently ate food outside the home setting. In comparison to the students identified as lean, they consumed more daily servings of eggs, potatoes (especially chips), carbonated soft drinks, sugar-sweetened drinks, and sweets. Students classified as lean has a larger intake of fruit, vegetables and dairy products, including milk. In terms of their socio-demographic profile those in the overweight/obese group attended urban schools, had less educated parents, came from smaller families and had working mothers.

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schoolgirls, with prevalence among a sample of 11-18 year-olds ranging from 48% to 60% (Madani, 2000). Abalkhail and Shawky (2002) linked the causes of anaemia frequently found in Saudi children to low levels of dietary iron and vitamin C or ascorbic acid (which enhances iron absorption). They found drinking tea (containing tannin) with meals acted as an inhibitor for iron absorption.

3.8 The dual burden household

Khan (2006) notes the emergence of a relatively recent phenomenon in countries in nutrition transition in which both underweight and overweight members co-exist within one household. She notes that these two conditions can be viewed as forms of malnutrition since both types of individuals may lack important dietary nutrients needed for good health and present deficiencies in minerals and vitamins. This “nutrition paradox” (Caballero, 2005: 1514), commonly referred to as the ‘dual burden household’, has been found in countries which have become more prosperous and urbanized over the course of a relatively short period of time, where the globalization of the food markets has led to the availability of low-cost, high-calorie foods.

Research on the underlying causes of this phenomenon is still limited but clearly this poses a particular challenge for any public health interventions. Already in 2000, De Onis and Blossner argued that there was no longer a clear correlation between economic development and levels of nutrition since problems of over- and under-nutrition now overlap and coexist within societies and even within households. They noted that this finding has profound implications for any nutritional interventions: “currently, strategies to tackle this dual burden of malnutrition are often pursued and promoted independently of each other. This will need to change, and policies and programmes developed that address both issues in an integrated manner” (De Onis and Blossner, 2000: 1039).

This overlap between over- and under-nutrition may explain why, within the same study of primary and secondary school pupils conducted in Abha, in the south-western region of KSA, Farghaly et al. (2007) found that amongst the 767 male and female students assessed some 18.9 per cent were underweight, 11 per cent were overweight and 15.9 per cent obese. Farghaly et al. (2007) thought that this high rate of underweight individuals could be explained by inadequate parental knowledge concerning weaning during infancy, healthy nutrition, and attitudes towards diet, all of which could predispose individuals to remaining underweight or becoming obese later in adulthood. They observed that some parents were more concerned about building up the weight of the infant than establishing healthy dietary habits which often caused different forms of nutritional deficiency throughout life.

3.9 Tackling obesity in the school setting

As this review has shown, obesity in children and adolescents is a complex disorder. In recent decades there has been a marked increased in its prevalence in KSA in both males and females and across all paediatric age groups. This mirrors what is happening in other Arab countries experiencing the nutrition transition. Childhood obesity is now considered a major health concern as it predisposes obese individuals to non-communicable diseases and psychosocial problems, in the short and long-term. The causes of obesity as frequently encountered in Saudi children and adolescents are multi-factorial and this epidemic will continue to increase in the coming years, in tandem with associated health concerns, unless successful multi-component strategies are devised to halt its progress (James et al., 2006).

Numerous researchers have emphasised the need for countrywide interventions aimed at encouraging healthier lifestyles for children in KSA, many of which focus on the role to be played by schools. As part of its Global Strategy on Diet, Physical Activity and Health, the WHO has recognised the crucial importance of the diverse ways in which schools can help to promote healthy lifestyles, in particular, good nutrition (WHO, 2008). There are some obvious reasons for use the school setting to combat childhood obesity. First and foremost, in most countries virtually all children attend school and spend a considerable amount of their time there so any types of interventions intended to improve children's eating behaviour would reach the vast majority of children in any given population for a concentrated period of time. Secondly, schools provide numerous opportunities for creating a health-supporting environment. As well as ensuring that healthy food choices are available for pupils, education about nutrition can be incorporated into an existing curriculum. It is also possible to encourage children to participate in physical activity and enjoy active break times (Brown and Summerbell, 2008).

In the KSA context, Al-Saeed (2006: 99) recommended that "health education programmes regarding obesity should be provided to all schoolchildren, their families and teachers". Al-Dossary et al. (2010:1008) called for "school based programs for preventing and reducing obesity in school age children by improving their nutritional status awareness, diet habits and life style in order to ensure health and longevity". As noted above, to date only Farghaly et al.

(2007:421) appear to have acknowledged the need to look more carefully at the food choices offered to children within the school setting, concluding that: “Health education and physical education programs in the schools are recommended to promote healthy life styles and dietary habits. School feeding programs may be required to achieve some of these goals”.

3.10 Gaps in current knowledge

This literature review of research on childhood obesity in KSA shows that previous studies have helped to identify the epidemiological features, risk factors, and lifestyle characteristics related to childhood obesity in KSA, which is a growing public health concern in KSA and in neighbouring Gulf States. However, these studies often described and analysed children’s dietary patterns and food consumption without relating these to the broader nutritional environments of KSA and to the multiple interconnected ways in which this influences children’s lives. The descriptions of the Saudi School Feeding Programme and the School Milk Programme in Chapter Two highlight how well-intentioned attempts to improve children’s nutrition can fail to achieve their goals because they did not consider the complexity of the organisational nutrition environment of the school and the perspectives of two of the most influential stakeholders within this, namely, parents and teachers. Further understanding of the process and the context means that the intended outcomes of programmes of this kind are more likely to become actual outcomes.

3.11 Conclusion

Examining previous school-based interventions in the UK context that were intended to target childhood obesity by improving eating behaviours amongst primary school children, Moore (11:12-13) points to the need for careful consideration of the nutrition environment since “education alone has been shown to be ineffective in influencing children’s eating behaviour […] Early indications are that even if nutritionally balanced meals are available, some children fail to consume them”. Given the urgency of tackling childhood obesity in KSA, it is vitally important that any future forms of school food provision do not repeat past mistakes.

Therefore, this study aims to fill the existing gap in research by attempting to establish the role that school food currently play in the diet and eating

behaviours of 6-12 year-olds in KSA. It will focus on two key stakeholders in the school setting, teachers and parents, since their role in both of the previous government interventions proved decisive. Without the cooperation of teachers, any health-related intervention in a school setting is unlikely to succeed. Informing parents about proposed changes and gauging their opinions on both the desirability and viability of those changes is vital to avoid misunderstandings and incorrect assumptions. This study will assess the strengths and weaknesses of the current system of school food provision in state primary schools in KSA from their perspectives and gauge their opinions on the desirability and viability of changing this provision. This will provide much needed insights into the factors that are likely to facilitate or hinder implementation of policies related to healthier school food provision in the nutrition environment of KSA and the implications that this has for future policy and practice.

The following chapter will describe the methodology employed in this study.

4 Chapter Four: Methodology

4.1 Introduction

This chapter presents the research methodology, design and approach used for this study. Quinlan argues that when conducting any study, it is important to describe "how the research was conducted and what philosophical assumptions underpin the research" (2011: 177) and this chapter explains in detail the data collection techniques used to achieve the aim and objectives of the research and the rationale for their use. This chapter is divided into several sections. It begins by describing the conceptual framework and the approach taken in the research and also details the research design, which includes both qualitative and quantitative data collection methods. Other aspects considered include the reliability and validity of the data collection methods, and ethical considerations of the research.

4.2 Research design

When designing this study, thought was initially given to the research paradigm and the research approach to be employed. Two distinct research paradigms, the positivist and the interpretivist, are generally used in Public Health research, and these reflect the ideologies behind the quantitative and qualitative methods respectively. The positivist paradigm employs methodological approaches typically associated with the Natural Sciences, involving objective analysis of phenomena and social realities (Khanal, 2012). Interpretivists, however, place greater emphasis on context and on participants' opinions in an attempt to understand, interpret, and gain meaningful insights into the lived social realities of research participants (Pope and Mays, 2006a). A third paradigm, pragmatism, "rejects the either/or choices associated with the paradigm wars, advocates for the use of mixed methods in research, and acknowledges that the values of the researcher play a large role in interpretation of results" (Tashakkori and Teddlie, 2003: 713). This study adopted a pragmatic paradigm, which combines features associated with both positivist and interpretive paradigms (Creswell, 2008) and is associated with the mixed methods approach.

Johnson and Onwuegbuzie (2004: 15) explain that "If you visualize a continuum with qualitative research anchored at one pole and quantitative research

anchored at the other, mixed methods research covers the large set of points in the middle area". In other words, as the name suggests, a mixed methods research approach involves the collection and analysis of both quantitative and qualitative data within a single study and the researcher is then required to attempt to integrate both of these approaches in the research process. According to Bryman and Bell (2007: 644), combining quantitative and qualitative methods is not only possible but also desirable, on the grounds that it gives "a greater prominence to the strengths of the data collection and data analysis techniques with which qualitative and quantitative research are each associated".

The mixed methods approach is well suited to carrying out multi-level analysis of complex issues, such as food choices, and subjects on which there may be very different stakeholder viewpoints, such as children's nutrition in the school setting. Combining both these approaches allows researchers to gather qualitative data from individuals whilst placing this in a broader societal context for the purposes of obtaining a more comprehensive understanding of an issue. When results are combined like this it can provide stronger evidence to support research outcomes, as corroborating one set of findings with another can help to enhance the validity and generalizability of research findings (Pope and Mays, 2006c).

This study followed a two-phase sequential mixed methods approach: a quantitative phase that used structured questionnaires followed by a qualitative phase in which semi-structured interviews and focus groups were conducted. These two methods complemented each other.

In this study, a survey questionnaire was used to provide an objective cross-section of the current eating habits of primary school age children in the city of Medina (KSA) in the home and school environment using data obtained from parents. In addition, the opinions of stakeholders (parents and teachers) concerning the current system of school food provision for state primary school children were surveyed as were their attitudes towards possible future changes to this.

Aspects of these quantitative findings from this survey of parents and teachers were then further investigated using semi-structured interviews and focus groups to gauge the attitudes of a range of stakeholders. The qualitative data

were analysed and then synthesised with the results of the quantitative phase and with findings from existing literature to address the research questions presented in Chapter One:

1. What role does school food currently play in the nutrition environment of 6-12 year-olds in KSA?
2. What do parents and teachers see as the strengths and weaknesses of the current system of school food provision offered in state primary schools in KSA?
3. What are the perceptions of these stakeholder groups with regard to the desirability and viability of changing this provision?
4. Which factors are likely to facilitate or hinder implementation of policies related to healthier school food provision in the nutrition environment of KSA and what are the implications of these findings for policy and practice?

4.3 Quantitative data collection: the questionnaires

The questionnaire was chosen as the most appropriate tool for this study as it enables the researcher to gather data from a large group of people within a short space of time (Bryman, 2015). In addition, in terms of analysis, processing questionnaire data is relatively fast and straightforward, especially using software such as SPSS. Additionally, questionnaires can offer anonymity to respondents, which is useful if issues are judged to be sensitive. However, as Dörnyei (2007: 115) notes, the questionnaire is not helpful "for probing deeply into an issue [because] it usually results in rather superficial data". It is not the best means of gauging how respondents feel about an issue (Robson, 2002).

4.3.1 Questionnaire development process

The quantitative component of this study consisted of two questionnaire surveys (one for parents, one for teachers). The seven-step process recommended by Churchill and Iacobucci (2002) for constructing an effective questionnaire was followed in this study (Figure 4.1).

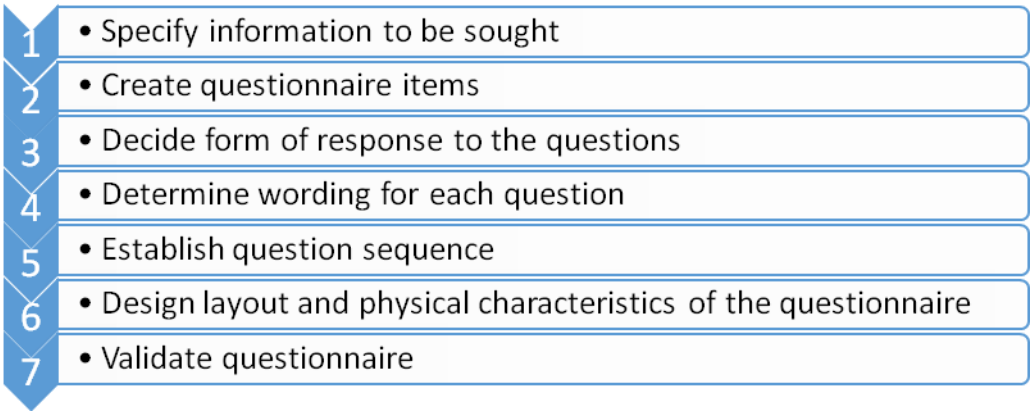


Figure 4.1 Guidelines for constructing an effective questionnaire (based on Churchill and Iacobucci, 2002).

Two questionnaires were required. One was intended for use with parents of 6-12 year-olds attending state primary schools in the city of Medina (KSA) and its aims were four-fold:

1. To gain an insight into the eating patterns of the chosen sample of primary school-age children

2. To gain an insight into the types of food which these parents provided for their children in the home and school environment

3. To explore parents' general attitudes towards the current system of school food provision offered in Saudi primary schools.

4. To explore parents' general attitudes towards the desirability and viability of changing the current system of school food provision in Saudi primary schools.

The second questionnaire targeted primary school teachers (male and females) in Medina and had two key aims:

1. To explore teachers' general attitudes towards the current system of school food provision offered in Saudi primary schools.

2. To explore teachers' general attitudes towards the desirability and viability of changing the current system of school food provision in Saudi primary schools.

These two groups were targeted for different reasons. Parents can be expected to have direct knowledge of the eating habits of their own children and some knowledge of the existing school food provision. They also directly influence

their children's food choices at home and to a lesser degree in the school environment. Although state primary school teachers in KSA currently play no direct role in any aspect of the system of school food provision, they can be expected to have informed opinions on the viability and desirability of changing this system. They also have the potential to influence students' food choices. Both these groups are stakeholders in this educational context and would potentially be affected by any changes made to existing food provision for students attending state primary schools.[18]

Table 4.1 shows the links between questionnaire objectives, themes and items.

Table 4.1Thematic overview of questionnaire items

Eating Habits of 6-12 year olds (Parents Only)
Themes: Children's eating habits at home: PQ2, PQ4, PQ13, PQ14 Children's eating habits at school: PQ5, PQ8, PQ9, PQ10, PQ16
Types of Food Provided for Children at Home and School (Parents Only)
Themes: Children's eating habits at home: PQ3, PQ12 Children's eating habits at school: PQ11
Stakeholder Attitudes Towards Current System of School Food Provision in KSA State Primary Schools
Themes: Broader health benefits of school food: PQ27/TQ16, PQ28/TQ17 Perceived importance of nutritional standards: PQ24/TQ13 Changes to current provision: PQ15, TQ7/PQ21, PQ18/TQ18, PQ19/TQ19
Stakeholder Attitudes Towards Desirability of Changing Current System of School Food Provision in KSA State Primary Schools
Themes: Social attitudes towards state versus family responsibility: PQ6/TQ20, PQ20/TQ4 Finance and school food provision: PQ20/TQ12, PQ17/TQ3, PQ7/TQ2
Stakeholder Attitudes Towards Viability of Changing Current System of School Food Provision in KSA State Primary Schools
Themes: Perceived preparedness: PQ23/TQ11, TQ5, TQ6 Trust in current system: PQ25/TQ15 Areas of responsibility: PQ22/TQ14, TQ9, TQ10 Whole school approach: PQ26/TQ8

[18] It became clear from the focus groups that some participants brought a dual perspective to the issue of school food provision since they were both parents and teachers.

Attempts were made to ensure that questionnaire items were worded in a way that would be unambiguous and easily understood. An example showing how to fill in responses was provided at the start. In terms of creating questionnaire items, some were modelled on examples found in earlier studies about school food provision in KSA (Al-Abdullatief, 2002; Amin et al. 2008; Alghamdi, 2009) and elsewhere (Alim et al., 2012; Habib-Mourad, 2013) that had been tested for reliability and validity (Bryman and Bell, 2007). The format was also influenced by examples found in previous studies. The questionnaires used to survey Saudi parents and teachers can be found in the Appendix together with an English translation.

On the parents' questionnaire (PQ), many of the items designed to provide information about the general eating patterns of children and foodstuffs available in the home and school environment used a multiple choice response tick box format, as illustrated in this example showing item PQ3 (Figure 4.2):

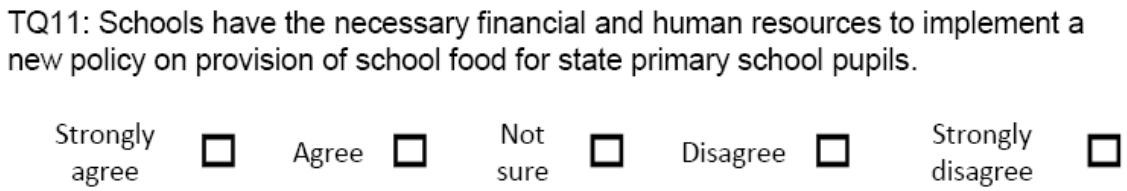
Figure 4.2: Multiple choice questionnaire item PQ3

PQ3: Which of these do you typically provide as breakfast for your child/children on a school day? Tick all those which apply.

Cereal	☐	Sausages	☐	Cheese	☐	Fruit Juice	☐
Toast	☐	Porridge	☐	Yogurt	☐	Flavoured Milk	☐
Eggs	☐	Honey	☐	Fruit	☐		
Milk	☐	Tea	☐				

For those items designed to explore parents' general attitudes towards the current system of school food provision in Saudi primary schools and the desirability and viability of changing this, an ordinal five-point Likert scale was applied, each response being allocated a score ranging from one to five. Thus, in the example below (Figure 4.3), 'strongly disagree' scored one and 'strongly agree' scored five. The Likert scale is frequently used in questionnaires examining individual attitudes and opinions for several reasons. Its relative simplicity makes it easy for respondents to understand, helping to ensure a high response rate. It is also relatively easy for administration and coding (Bryman, 2015).

Figure 4.3 Example of questionnaire item TQ11 using five-point Likert scale



A similar format was adopted for the teachers' questionnaire (TQ) in which the majority of items were focused on attitudes.

Although the final versions of the questionnaires were in Arabic (the first language of all study participants and the researcher herself) the initial versions of both questionnaires were produced in English. This was largely so that feedback on the content of these could be provided by the supervisory team and partly because some of the items included were based on previous studies originally published in English, as noted above. When the first draft of the questionnaires had been constructed (PQv.1 and TQv.1), the researcher's supervisory team[19] provided detailed feedback on the suitability of the questionnaire items as part of the validation process. Following discussion, a second English draft of each was produced (PQv.2 and TQv.2).

For the pilot study, the researcher herself undertook the translation/adaptation of PQv.2 and TQv.2 into Arabic, reviewing Arabic questionnaires as models and contacting other Arabic-speaking researchers at Taibah University (Medina) and Leeds University with specific linguistic queries by email. When these Arabic versions were complete, these were checked by a professionally qualified translator to ensure they accurately rendered the contents of PQv.2 and TQv.2 and were free from linguistic or typographical errors.

4.3.2 Piloting the questionnaires

Conducting a pilot study provides a good opportunity to identify and correct any potential problems with a research instrument and to refine data collection procedures (Gill and Johnson, 2002). The main purpose of the pilot study was to check if instructions were sufficiently clear, and whether items might need modification. Once ethical approval had been received for the study, the Arabic version of PQv.2 was piloted with eight respondents from Saudi families with

[19] Questionnaire development and piloting were carried out with the researcher's original supervisory team which did not include Dr Morley and Dr Patel.

primary-school age children. A covering letter explaining the purpose of the study together with a consent form was emailed out. This was followed by the questionnaire once consent was received. Following a similar process, five Saudi primary school teachers were also recruited to pilot the teachers' version. After completing the questionnaire, respondents were also invited to provide any suggestions they had about improvements to any aspect of the questionnaire.

As a result of the pilot study, an example clearly showing how to complete the items was inserted at the start of the questionnaires. Some open-ended follow-up questions were also added, allowing respondents to expand on their answer, if desired. Several respondents suggested that some of the specialist Modern Standard Arabic terms that were used might not be understood by all Saudi Arabic speakers; consequently, some items were rephrased to ensure their meaning was clearer. The content of some items was also altered on the basis of feedback received e.g. the range of price options relating to school food costs was altered.

Feedback on a revised version of the questionnaires in English (PQ.3 and TQ.3) was once again sought from the original supervisory team while two Arabic-speaking academics from Taibah University (Medina) were asked to comment on the revised Arabic questionnaires (PQ.3A and TQ.3A) and some minor linguistic and format changes were made. The final version of the questionnaires used to survey Saudi parents and teachers together with English translations for non-Arabic speakers can be found in the Appendix.

4.3.3 The sampling design for the main study

Medina, a city situated in the Hejaz region of KSA (see Figure 1.1) was chosen for this study because the researcher has well-established personal and professional links with the educational sector in this city. As previously noted in Chapter Two, Saudi society is characterized by collectivism (Hofstede and Peterson, 2000) and there is often an overlap between the professional domain of work and the private domains of family and friendship. In addition to professional credentials, these interpersonal links, referred to as *wasta*, can be an important element in gaining the confidence of gate-keepers and study participants (Hutchings and Weir, 2006).

4.3.3.1 The sampling scheme

The sampling scheme refers to the "explicit strategies used to select units (e.g. people, groups, settings, and events) for the study" (Collins et al., 2007: 271). Given that specific groups of respondents were sought from the wider population, purposive sampling was used in which "some members of the wider population definitely will be excluded and others definitely included (i.e. every member of the wider population does not have an equal chance of being included in the sample)" (Cohen et al., 2007: 110). One of the principal advantages of a purposive sampling strategy when using questionnaires is that it is likely to produce a higher response rate (Bryman and Bell, 2007).

Thus, two separate samples were targeted as respondents for each questionnaire:

- PQ: Parents of 6-12 year-old boys and girls attending state primary schools in Medina
- TQ: Staff (male and female) teaching 6-12 year-olds in state primary schools in Medina.

Since the Saudi system is gender-segregated, even at primary school level, the decision was made to target parents at one boys' school and one girls' school. Both male and female teachers were also targeted to ensure representation of the two groups. However, as the aims/objectives show (section 1.5), the study was not focused on comparing gendered perspectives in relation to school food provision.

4.3.3.2 The sample size

According to Cohen et al. (2007) it is not possible to talk of a "correct" size for a sample since this depends both on the nature of the study and the population being investigated. However, in quantitative studies the general consensus is that the larger the sample is, the better, since this enables the use of more sophisticated statistical techniques and is likely to enhance the reliability of the results (Tabachnick and Fidell, 2013). Usually a basis would be sought from previous studies but most of those conducted in KSA that had featured survey questionnaires were carried out by a large team of medical researchers across several whole school populations and so are not comparable. For statistical analysis, Tabachnick and Fidell (2013) suggest that a minimum of 300

responses is adequate and that 500 would be considered good. The aim for the sample for the PQ was 400 and 100 for the TQ as discussions with other postgraduate researchers from KSA suggested that response rates for research surveys with official endorsement tended to be high.

4.3.4 The survey process

The Local Education Authority in Medina was contacted and permission was sought to conduct the study and help sought with distributing the questionnaire (see Appendices B and C). This was judged to be the optimal way to easily gain access to the numbers of participants needed for this study. After obtaining permission from the relevant authorities, the questionnaire for parents (PQ.4A) complete with covering letter and consent form was emailed to a named contact in the Medina Local Education Authority. This administrator then chose two primary schools (one for boys and one for girls), and forwarded this email to the school manager: the researcher did not have any say in this choice. Each school manager then photocopied and distributed 200 hard copies of the questionnaire to pupils who took one home to their parents. Parents wishing to participate were given a week to complete and return the questionnaires in sealed envelopes which were then collected by the researcher from the Medina Local Education Authority office.

Previous researchers have noted that in KSA it can be difficult to get government employees such as school teachers to volunteer their opinions on government policy (Albakhail, 2016). Therefore a different approach was used to distribute the teachers' questionnaire, using a form of 'snowballing' technique. The researcher send an email explaining the purpose of the survey and a call for participants to her own professional and personal connections, asking them to contact potential respondents i.e. state primary school teachers working in Medina who would be willing to fill in questionnaires. These contacts in turn then contacted other potential respondents and so on until the researcher had obtained contact details for 50 male and 50 female primary teachers who were willing to participate in the study. A Microsoft Word document containing the covering letter, consent form and questionnaire was sent as an email attachment and respondents were given one week to return their questionnaires.

4.4 Quantitative data analysis: the questionnaires

4.4.1 Initial processing

After the deadline for completion of questionnaires had passed, the teacher questionnaires returned by email were printed out. A visual check was conducted to ensure that (1) all questionnaires from parents and teachers were accompanied by a completed consent form and (2) the respondent was eligible to participate on the basis of their response to the initial screening item. This had been added to both questionnaires to ensure that all teachers surveyed were employed in state schools in Medina and that all parents had provided responses that related purely to the system of school food provision in the state sector. After discarding any unusable questionnaires, all remaining questionnaires were then given an identifier: TM (male teacher), TF (female), PB (returned from boys' school) and PG (girls' school) plus a number. All cover sheets/consent forms were then removed and stored in accordance with good practice.

The researcher then carried out a more detailed visual inspection on each questionnaire to identify any that were unusable because they have been incorrectly completed or were missing substantial quantities of responses. All of the responses to the closed-ended or multiple choice questionnaire items were considered to be usable for the purposes of analysis. It was then possible to ascertain the rates of response for the questionnaires.

4.4.2 Response rates

A total of 400 questionnaires were distributed to parents: 200 to the boys' school and 200 to the girls' school (Table 4.2).

Table 4.2 Parental questionnaire response rate

Questionnaires	Boys' school (N/%)		Girls' school (N/%)		Parents: Total (N/%)	
Total distributed	200	100	200	100	400	100
Returned	148	74	153	77	301	76
Ineligible/incomplete	2	1	4	2	6	2
Usable	**146**	**73**	**149**	**75**	**295**	**74**

Of these, 148 and 153 respectively were returned. A total of six overall were unusable either because respondents were not eligible to participate or because

they failed to complete the questionnaire correctly. This meant a total of 295 questionnaires in total were useable, representing an overall response rate for the parents' questionnaire of 74%.

It is important to emphasise that for the parental questionnaire there is no necessary correlation between the gender of the questionnaire respondent and the gender of the pupils. It was made clear both in the covering letter and in the questionnaire itself that when completing the questionnaire, the respondent (whether father or mother) was being asked to provide information about all the primary-school age children in their household attending the school. So it should not be assumed either that fathers completed questionnaires from the boys' school and mothers from the girls' schools, or that these results relate only to a single boy or girl in each case.

In addition, 50 questionnaires were distributed to male teachers and a similar number to female teachers (Table 4.3). These groups returned 43 and 37 questionnaires respectively. Of the total of 80 questionnaires returned, 3 were found to be unusable, leaving a total of 77 usable questionnaires, giving an overall response rate of 77%. In this case, there was a more noticeable difference between the response rates for the groups by gender, with 82% for males versus 72% for females.

Table 4.3 Teachers' questionnaire response rate

Questionnaires	Males (N/%)		Females (N/%)		Teachers: Total (N/%)	
Total distributed	50	100%	50	100%	100	100%
Returned	43	86%	37	74%	80	80%
Ineligible/incomplete	2	4%	1	2%	3	3%
Usable	**41**	**82%**	**36**	**72%**	**77**	**77%**

As with the parental responses, teachers' responses were combined for analysis. However, in this case, given the gender segregation system in the Saudi education system, female and male teachers were reflecting specifically on their experiences of girls' and boys' schools respectively. This does mean that there was a possible gendered dimension in these responses.

4.4.3 Data analysis

Firstly, all of the raw data gathered from the questionnaires had to be transferred manually to an Excel spreadsheet. Questions involving categorical responses were coded as numerical data or codes, e.g. 'yes'= 1 and 'no' = 0. A five-point Likert-scale range of 1-5 was used for the response to each question.

The data were then imported into the software Statistical Package for the Social Sciences (IBM SPSS v.23, 2013) in order to produce descriptive statistics as either frequencies and percentages or means and standard deviations (SD) for categorical and continuous data respectively. The Chi-squared test was used to look at differences between parents of children attending boys' versus girls' schools and male versus female teachers for each item. It compares the frequency of cases found in the different groups of one variable with those of another variable, establishing whether or not the frequencies observed differ from what would be expected (Field, 2009). A p-value equal to or lower than 0.05 was set as the criterion for statistical significance, indicating that a statistically significant association exists between two variables and that there are statistically significant differences between the groups.

The open-ended items on the questionnaires were processed as follows. All the responses, like the questionnaire itself, were written in Arabic and initial content analysis of the comments written by respondents was based on this Arabic text. Any comments were summarised using keywords/phrases and these were then recorded on an Excel spreadsheet, noting how many times each keyword/phrase was used. These keywords/phrases were first translated by the researcher herself and then checked by a suitably qualified translator to ensure they were accurately rendered in English. This English version of the Excel spreadsheet was then used to produce bar charts showing the frequency of mentions for keywords/phrases.

4.5 Qualitative data collection: the interviews

As noted previously, since questionnaires are not useful for probing for details and explanations, the second phase of the study employed two qualitative methods to supplement the quantitative data, namely, semi-structured interviews and focus groups. This section focuses on interviews.

4.5.1 Types of interviews

In the context of research, an interview can be defined “as an exchange of information and ideas between two or more people through questions and responses, resulting in communication and joint construction of meaning about a particular topic” (Janesick, 2004:72). Holstein and Gubrium (2003:19) emphasise that both the interviewer and the interviewee can be said to collaborate by sharing their knowledge to produce meaning in relation to the topic being studied. In interviews, participants are able to discuss their personal point of view on particular situations or phenomena, explaining how they interpret their world (Kvale, 1996: 11).

Interviews for qualitative data collection are normally classified in three different types: structured, unstructured or semi-structured. The first of these, structured interviews, are highly formalised and all the respondents are asked the same carefully prepared series of questions. These have usually been piloted and then refined by the researcher (Easterby-Smith et al., 2008:142-143). This limits flexibility in how questions are asked or responded to and they tend to be designed to be closed rather than open-ended. This type of interview can be a useful means of obtaining factual information about specific tightly defined topics. It was not employed here because it was important to allow interviewees freedom to provide their own personal opinions on the topic

On the other hand, unstructured interviews are used to solicit information about a particular set of topics but in this case, prior categorisations are not enforced, facilitating a more flexible inquiry process. Questions are often based on a brief set of prompts or bullet points or the researcher may use one single open-ended question to start the interaction and then interviewees are allowed to respond as they wish. The interviewer often simply responds to points made by the interviewee to keep the conversation flowing (Bryman and Bell, 2007). This type of interview is often employed when exploring research topics focusing on the complex behaviour of individuals within society. However, when interviews are completely unstructured, it can be difficult to identify common themes.

As the name suggests, semi-structured interviews combine some of the features of structured and unstructured interviews. In this type of interview, the researcher may choose to prepare some closed questions to elicit some factual data and to ‘break the ice’ but normally he or she prepares an interview guide in

advance. This consists of a core list of themes and issues within the framework of the research questions which are to be covered during the course of the interview (Bryman and Bell, 2007; Myers and Newman, 2007). Semi-structured interviews are flexible allowing the interviewer to explore interesting issues which emerge from interviewee responses by probing further to obtain more in-depth insights (Bryman and Bell, 2007). The order in which questions are asked can easily be altered and the choice and wording of questions can vary from one interview to another, depending on the flow of the conversation (Saunders et al., 2012).

For this study, semi-structured interviews were selected because it was thought that they would allow participants to "respond to a certain set of questions" which can provide factual information for the researcher but at the same time they also allow participants to have "the freedom to talk about what is of interest or importance to them" (Hesse-Biber and Leavy, 2010:3) which may vary significantly from one stakeholder group to another. The semi-structured interview format creates a general framework for the interviewer, allowing an element of comparison when this is appropriate.

Myers and Newman (2007) note that although interviews provide a useful means of gathering rich qualitative data, they do present a number of challenges, particularly for inexperienced researchers. First and foremost, in terms of resources, conducting interviews is time-consuming, as is the process of transcription and analysis which follows. Secondly, in order to facilitate effective interaction, the interviewer requires good communication and interpersonal skills (Fielding and Thomas, 2008). Good communication skills include elements such as listening, framing questions in an understandable and interesting manner, ensuring that the question posed has been properly comprehended, and encouraging responses (Marshall and Rossman 1999; Myers and Newman, 2007). Interpersonal skills are equally important, including the ability to put interviewees at ease, build trust and create rapport with them (Kaufman, 1994; Longhurst, 2009). Moreover, as a research method, interviews are considered to be subject to the common problems of poor recall, inaccuracy and bias on the part of the interviewer (Easterby-Smith et al., 2012).

Precautions were taken to limit these risks in the following way. In order to minimise poor recall and inaccuracy, wherever possible interviews were audio-

recorded and notes taken and transcripts/notes of interviews were written up as soon as possible after the actual interview to ensure an accurate written record of this was made. Also during the interview, where necessary, the interviewee was politely requested to clarify any points that were unclear. Two of the interviewees later provided weblinks to official documentation that provided further details on points they raised. The researcher took care to attempt to maintain a balanced role so that whilst facilitating dialogue, every effort was made not to impose the researcher's own ideas or to lead interviewees into saying things that simply confirmed her own opinion.

As noted, interpersonal skills are important in successful interviewing. The role of the interviewer is a difficult one since it involves striking a balance: participants must be allowed to have the freedom to express their feelings but at the same time, the interviewer must ensure that the conversation remains firmly anchored to the focus of the study. It is important to build rapport with interviewees to make them feel at ease as this is likely to increase the chances of gaining information from them that will provide helpful insights into their personal attitudes. Prior to the actual interview, reassuring informants about the confidentiality of their opinions helped to build trust (Kaufman, 1994). When interviewing officials it was important for me to establish my research credentials and the permission from the Ministry was important in this context. In the Saudi context, personal recommendation from gatekeepers was often essential in facilitating interviews with parents.

4.5.2 Bias and positionality

It is important to be aware that the interview process may be influenced by aspects of the researcher's own training, background, personal experiences and beliefs and this may create bias. As Lucas comments "I am, as a researcher, a product of who I am as a person" (Lucas, 2005: online) and in this case, the researcher's personal perspective as a mother of primary school age boys, with experience of the school meals provision in the English educational system and a strong desire to improve nutritional standards for young children must be acknowledged.

When conducting qualitative research of this type it is also important to reflect openly on the issue of positionality so that readers are able to decide for themselves how the data which is presented in the study might be interpreted. A

researcher's positionality as an 'insider' or 'outsider' can impact on the outcome of an interview (Bourke, 2014). Bourke (2014) notes that originally it was argued that researchers adopted either an 'insider' or 'outsider' position depending on the type of research being conducted but more recently it has been suggested that this distinction is too simplistic and that all researchers navigate often complex insider/outsider issues. Bourke (2014: 2) maintains that the role of researcher is better conceptualised as a continuum of "multiple overlapping identities".

Bourke (2014) also asserts that the degree of distance or closeness between the researcher and the participants in a study can affect the richness and quality of data, and that variables such as gender, race, ethnicity, class, religion, political stance, socio-economic status and educational background all have the potential to influence researcher/participant interaction and thus affect the research process. It is generally assumed that a common culture between interviewer and interviewee can provide a fertile ground for gaining access, establishing trust, nurturing rapport, asking meaningful questions and reaching empathetic understanding (Bourke, 2014).

The fact that I shared a common language and cultural norms and values with the participants was extremely important, making me an 'insider'. Knowing the nuances of the language allowed me to ask probing questions while remaining sensitive. I was also able to interpret body language which conveyed positive or negative attitudes not necessarily articulated in the spoken language. This was particularly important in the focus groups.

Although interviews have some shortcomings as a data collection method, they can be an excellent tool for exploring people's attitudes towards and feelings about a topic and for allowing them to reflect on these. For this reason, interviews were chosen as an appropriate means of addressing the research questions and objectives because they provide a more in-depth understanding of the opinions and feelings of stakeholders concerning provision of schools meals and their reasons for holding particular viewpoints. The interviews were also useful for clarifying factual information in relation to processes and procedures relating to the current system of school food provision and for exploring points which had emerged from the questionnaire analysis.

Initial interview questions were drafted in Arabic (the mother tongue of the target participants) and discussed with the male interviewer to obtain feedback regarding wording, comprehensibility and suitability. An English version of these was also discussed with the original supervisory team. The finalised interview guide was produced in Arabic.

4.5.3 Sampling strategy

As previously noted, sampling is a necessary step in terms of choosing respondents to participate in any research project since it is rarely practical to study whole populations (Tracy, 2013). Therefore, researchers select samples and well developed sampling decisions are crucial for any study's soundness (Marshall and Rossman, 1999). The interviewee sample was purposive sampling which is a type of non-probability sampling. This technique enables researchers to choose the sample based on their own judgement regarding which individuals they think would be appropriate for the study. This type of sampling is primarily used when there are limited numbers of particularly relevant and informative people who are able to answer the research questions and meet the study's objectives (Saunders et al., 2012). In this case, some of the participants were chosen as specific individuals, who had the correct expertise to answer the questions relating to the research area, for instance officials and those in positions of authority.

In order to gain a range of perspectives on school food, it was initially decided to interview two groups of stakeholders. The first were those who occupied positions of authority or responsibility in primary schools and had decision-making capacities which meant they were more likely to exercise power and influence: their point of view would be critical in future debates about provision of meals in primary schools. The second group of stakeholders were less likely or able to influence decision-making directly, but still had important stakes in the debate. Interviews were therefore conducted with the following individuals:

Table 4.4: Distribution of interviewees

PARTICIPANTS	STAKEHOLDER ROLE
Ministry of Education official (1)	Responsible for implementing central government policy at local authority level
Ministry-appointed School Health official (1)	Responsible for carrying out field visits to public-sector school canteens in Medina to make sure that all the health and hygiene requirements are met
Ministry-appointed school manager (1 boys' primary school + 1 girls' primary school= 2)	Responsible for contracting supplier for school canteen and for implementation of health requirements at school canteens and for reporting any violations to the School Health Unit (Medina).

4.5.4 Interview process

Interviews were conducted in a range of settings as appropriate. It is necessary here to say something about the cultural context for the interview since the usual process which would entail the researcher herself conducting all the interviews was not possible in this case, due to the strict gender segregation which operates in KSA. Primary schools are single-sex institutions, staffed by all male or female staff as appropriate. Once I had secured Ministry permission for the study, as a female researcher I was able to gain access to the girls' school and conduct interviews there with the school manager. The Ministry-appointed School Health official was interviewed in her office.

For religious and cultural reasons, in the Saudi context, most interviewees would only feel comfortable about being interviewed in the same room by someone of their own gender. Therefore, the male Ministry of Education official and the male school manager of the boys' primary school were interviewed at a mutually convenient time via Skype which most interviewees will now consider acceptable.

At the beginning of the interview, the purpose of the study was briefly explained and interviewees were reminded that their participation was voluntary. Each participant signed a written consent form that assured data confidentiality and participant anonymity and it was explained that any information given would be used for research purposes only. Just before the beginning of each interview,

the participant's permission to record the interview was specifically sought. At the end of the interview, each individual was thanked for their participation.

Two of the interviews lasted for 30 minutes; the shortest was 20 minutes in length and the longest 45 minutes. All interviews were conducted in Arabic. Wherever possible, interviews were recorded, with the agreement of the interviewees; however, one interviewee preferred not to have their views recorded and another asked for the recording to be stopped before the interview was concluded. In these cases, notes were taken by the interviewer and then written up immediately afterwards.

After the interviews, audio files were originally transcribed in Arabic by the researcher and translation into English was only used a later stage when themes were identified and illustrative quotes had been chosen for use in this thesis. Since the process of coding was essentially the same process for both interviews and focus groups this is described after the focus group section.

4.6 Qualitative data collection: focus groups

4.6.1 Advantages and disadvantages of focus groups

Similar to the semi-structured interviews, focus groups were used to complement the knowledge. According to Wilkinson (2004: 177) a focus group is "a way of collecting qualitative data, which—essentially—involves engaging a small number of people in an informal group discussion (or discussions), focused' around a particular topic or set of issues". Although various kinds of researchers have used focus groups since the 1920s, for many years they were largely thought of as a technique used to collect and analyse data about consumer attitudes and opinions (Greenbaum, 1998). However, since the 1980s, focus groups have become a more recognised technique for collecting qualitative data by social science researchers (Madriz, 2000), and have been used successfully in nutrition research (Draper and Swift, 2011).

Draper and Swift (2011: 4) note that when focus groups are carefully managed, they can offer an efficient method for gathering data from several participants simultaneously. They also highlight that this form of data collection takes into consideration "the fact that individuals do not make decisions or form their opinions in a social vacuum" (Draper and Swift, 2011: 4). Since the focus group environment is socially oriented, the sense of belonging to a group can also

mean that participants may feel safer sharing information (Vaughn et al., 1996). Group members can often stimulate new thoughts for each other, which might not have otherwise occurred and the verbal interaction within a focus group can reveal “a layer of meaning over and above what is gained in individual interviews” (Draper and Swift, 2011: 4). Furthermore, the facilitator can also observe nonverbal communications and group interactions that occur among the participants and help them to capture a clearer picture of what people are thinking and feeling about a topic (Morgan, 1998).

However, focus groups also pose a number of challenges as a research method as Wengraf (2001) highlights and the discussion needs to be carefully planned, structured and directed by a moderator or facilitator which is usually the researcher. The results might not necessarily accurately represent differing opinions amongst the members of the group as a result of the group dynamics that can occur, meaning that one individual can dominate the other members of the group, or those who are lacking in confidence to express their own opinions might simply agree with others. Holding a pilot focus group was useful preparation for moderating the focus groups in Medina and trying out linguistic strategies to overcome these difficulties. In addition, transcription and analysis of the focus group data requires a considerable investment in time which needs to be factored into research time planning.

4.6.2 Pilot focus group

A pilot focus group was arranged with a group of six Saudi mothers who had children of primary-school age who met in the researcher’s house in May 2015 in the UK. Participants were recruited via the Saudi student network. This proved to be a very valuable learning experience and some key points emerged from the session.

Firstly, it initially proved difficult to recruit participants as they associated the idea of a focus group with market research and assumed I was part of a commercial company. This meant that thought needed to be given to explaining this concept to Saudis as being part of a research project and also to identify the possible benefits for them and emphasising these. It was decided that refreshments would be served as minor incentive and also to break the ice.

Secondly, even though a list of topics and questions to address was prepared in advance to serve as a guide, it was a complex task trying to facilitate the discussion and to ensure that all opinions are respected and that all opinions on a particular issue get a chance to be heard. Some participants needed to be prompted to speak, whilst others were overly talkative. Running the pilot focus group in Manchester helped me to be much better prepared for moderating the focus groups in Medina.

4.6.3 Recruiting participants

The composition of the focus group was selected to reflect the needs of the study, and was intended to be a representative sample of the key stakeholder groupings. In this case, these were judged to be parents and teachers. Onwuegbuzie et al. (2009) recommend that a focus group should include a sufficient number of participants to provide a range of information, but should not be too large as some people may find large groups intimidating. Originally the aim was to recruit 6-8 participants for each grouping but, on the day, individuals who had previously stated their intention to attend failed to show up for various reasons. Krueger (1994: 17) mentions the usefulness of using mini-focus groups" including just three or four participants, when these individuals have specialized knowledge and/or experiences to discuss in the group. In the case of the teachers' group, even though the numbers were smaller, this still managed to provide some very useful data.

Table 4.5 Focus groups composition and rationale

Teaching staff **(4 boys' school + 4 girls' school = 8)**	Responsible for delivering national curriculum to primary school pupils, they have day-to-day contact with boys/girls in this age group and could potentially be affected by changes to the current school canteen system. They have no decision-making responsibility or direct input into school policy on nutrition.
Parents **(4 mothers + 4 fathers = 8)**	Responsible for nutrition in the home setting, they also directly or indirectly influence their own children's eating habits in the school environment in various ways. They have no decision-making responsibility or direct input into school policy on nutrition.

Table 4.6 Focus group schedule

Group 1	Mothers (5)	6 August 2015	45 mins
Group 2	Teachers: girls school (4)	18 August 2015	40 mins
Group 3	Fathers (4)	24 August 2015	45 mins
Group 4	Teachers: boys school (4)	24 August 2015	35 mins

As previously noted, due to the strict gender segregation which operates in Saudi society, appropriate arrangements needed to be made to accommodate this. Thus, one of the researcher's male relatives who works as the head of a private boys' school in Medina but has also worked in the state sector, conducted focus group session with school staff and fathers after having been briefed by the researcher. He already had experience of conducting focus groups and also understood the educational context for the study. He was thoroughly briefed on the nature of the study, the procedures which needed to be followed and worked with the guide devised for the study. Moreover, since he was already known within the local community, interviewees participating in the focus groups were generally willing to be recorded which gave me access to this data for the study. Permission was secured from the local authority and the school manager who then sent out an email request for volunteers to join the fathers' and the staff focus groups.

I contacted the local girls' primary school with the permission of the local authority and the school manager allowed me to conduct the focus group with female teaching staff. She also sent out a request to mothers to contact me by email. However, since this initially only resulted in one reply, the 'snowballing' technique was again used, with this individual then using her Twitter account to tweet other mothers with daughters at the school and this proved a more successful means of finding participants. The general preference expressed by mothers was for the focus group to be held in my own home and arrangements were made for this.

All of the focus groups were conducted in Arabic. Before beginning, the purpose of the study was briefly explained and everyone was reminded that their participation was voluntary. Each participant signed a written consent form that

assured data confidentiality and participant anonymity and it was explained that any information given would be used solely for research purposes. Just before the beginning of each session, each participant's permission to record the focus group was specifically sought. At the end of the session, everyone was thanked for their participation.

4.7 Other information sources

Whilst I was in the schools to conduct the interviews and the focus groups, I was also given a tour of their facilities by the school administrator in each case and they were happy for me to ask further questions, make notes and take photographs whilst I was on the premises. In addition, via personal contacts, I was also invited to visit the facilities at one private primary school for the purposes of comparison.

It was not the aim of this research to include the views of primary school pupils so they were not included in interviews or focus groups.

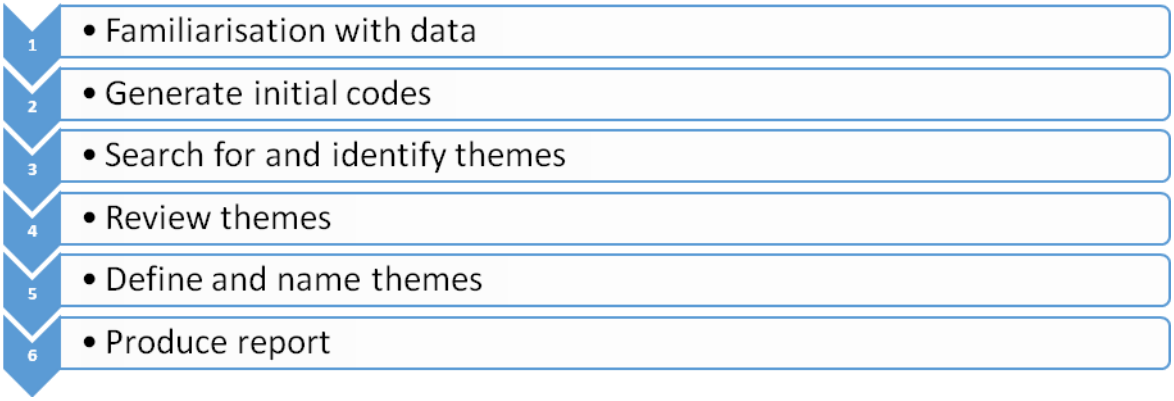
4.8 Coding and analysis process

4.8.1 Content or thematic analysis

The qualitative data generated from the interviews and focus groups was subjected to a technique known as content or thematic analysis, described by Ayres (2008:867) as "a data reduction and analysis strategy by which qualitative data are segmented, categorised, summarised, and reconstructed in a way that captures the important concepts within the data set". Braun and Clarke (2006) argue that this method of identifying and analysing thematic patterns has a number of advantages when dealing with detailed data such as that which has been generated from interviews or focus groups. Firstly, unlike some other approaches such as discourse analysis, as a method it is relatively easy to learn and carry out and is also flexible. It is also a useful method for summarising large quantities of data by helping to identify key features, such as similarities and differences in the data set. It can also help the researcher to generate unanticipated insights from the collected data.

The process of the thematic analysis followed the six phases suggested by Braun and Clarke (2006:87).

Figure 4.4 Phases of thematic analysis (Source: Braun and Clarke, 2006)



4.8.2 Phase one: familiarization with the data

After every interview or focus group the content of the recording was fully transcribed, transferring the verbal data into a textual form which made it accessible for working with. Any information that was judged to be important for the purposes of fully understanding what was said was transferred onto the transcript in square brackets. Other elements were also noted when these indicated that the speaker felt particularly strongly about what he or she was saying. In this case, bolded type and underlining together with a bracketed comment was used to represent the degree of feelings expressed about a topic.

For example, one of the female teachers commented on the difference that had been made by a new colleague in terms of school food provision:

> *TF4: […] we have a young teacher who studied nutrition in America. She went there with her husband and did a postgraduate course. She checks everything,* ***every single thing*** *[EMPHASISES EVERY WORD]. Too much sugar – not for sale. Artificial colouring – not for sale [MIMES THROWING SOMETHING AWAY].*

All the interviews and the focus groups were carried out in Arabic since few of the participants would have felt able to express themselves adequately in English. The researcher read each transcript several times to familiarise herself with the data which had been collected, at the same time making notes on first impressions. Although this reading and re-reading of transcript data is time-consuming, as Braun and Clarke note, this phase "provides the bedrock for the rest of the analysis" (2006:87) and due care must be taken. At this stage, any factual data concerning processes and procedures relating to the school canteen was also identified.

Other Saudi postgraduate researchers I consulted had advised me not to use Arabic with NVivo 10, a well known software programme which is used for qualitative analysis, coding and categorising. They had found that although the text appeared fine at the initial inputting stage, they had then encountered problems with right-to-left text when attempting to group quotes and build initial themes. Copying quotes within the software had also proved problematic as the Arabic text then split into sections, meaning it could not be read. The decision therefore was made to work manually with Arabic in the first instance.

4.8.3 Phase two: generating initial codes

Once the researcher had become more familiar with the data and some brief notes had been made, the second phase of thematic analysis began. This involved identifying "the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way" (Boyatzis, 1998 cited in Braun and Clarke, 2006) and then assigning names to the segments. These components are known as codes and will be used to help build themes. In this phase, any element that the researcher thought relevant to research aims or which related to topics from the literature review was coded even if the ideas which emerged seemed contradictory (Braun and Clarke, 2006), for example, school canteen food is too cheap/too expensive. In this phase, a large number of codes were initially generated, sometimes up to twenty for a focus group, and this collating process was done simply by highlighting text in different colours or adding comments using the tracker function on Microsoft Word. An extract from the transcript of the fathers' focus group (see Appendix K) illustrates how these clusters were produced. Three attempts were typically made before arriving at the final groupings.

4.8.4 Phase three: identifying themes

When all the data had been coded, the researcher started to group these codes into clusters, attempting to identify sub-themes and themes relating to the research aims and other nutrition-related issues. In this context, a theme can be defined as "a pattern in the information that at minimum describes and organises the possible observations, and at maximum interprets aspects of the phenomenon" (Boyatzis, 1998 cited in Braun and Clarke, 2006: 161). Thus, to illustrate this with a concrete example, analysis of the transcript of the fathers'

group identified a number of comments that referred to the role of women (mothers/wives) in relation to food: they were providers of food for children; they encouraged healthier eating habits in the family; they made choices about food/food-related items; they took an active interest in nutritional matters. When grouped together they pointed to a possible underlying theme about gender roles and attitudes towards responsibility for children's eating behaviours.

Carey and Smith (1994:125) stress the need for researchers to "attend to the impact of the group setting" when analysing focus group data. It is very common in Arab societies for individuals to exercise a greater or lesser degree of what could be called 'self-censorship' (Albakhail, 2016) if they feel uncomfortable talking about certain issues in front of people they do not know. This can be reflected in the use of hesitation, unfinished sentences, euphemistic expressions, gestures or tone of voice that leave the other participants to draw their own conclusions. In these cases, the researcher had to use her insider knowledge of Saudi society to try to understand what the speaker might be attempting to imply and to interpret this appropriately when allocating labels to categories.

This is one of the reasons why the frequency with which a particular topic was mentioned was not necessarily a reflection of the importance that an issue appeared to be given by participants in the group. Sometimes it was clear that one comment was viewed as very significant by all or most participants in terms of how strongly they responded to it. This was the case where an incident mentioned by one of the fathers provoked strong emotional responses from the other three participants. Initially they were highly delighted as he recounted his decision to raise an issue concerning a breach of food canteen regulations directly with the authorities. They were then visibly shocked when he recounted the dismissive response he received from an official. This later proved to be part of a bigger theme concerning 'making one's voice heard'.

4.8.5 Phase four: reviewing themes

During the next phase the researcher needs to carefully review the themes which have been identified because:

> It will become evident that some candidate themes are not really themes (e.g., if there are not enough data to support them, or the data are too diverse), while others might collapse into each other

> (e.g., two apparently separate themes might form one theme). Other themes might need to be broken down into separate themes (Braun and Clarke, 2006: 91).

This phase is time-consuming, requiring multiple careful reviews of themes and subthemes and a number of changes may be made. The researcher must attempt to discover any overlapping or redundant codes or any codes that do not appear to fit within an identified theme.

4.8.6 Phase five: defining and naming themes

In this penultimate phase a bigger picture should begin to emerge about how each of these themes relates to the research aims and also the extent to which these are interconnected (Braun and Clarke, 2006). This phase is not complete until the researcher has identified the essence of each theme and clearly named and defined these (see Chapter Six).

Since translating the whole text of all the transcripts would have been a prohibitively costly process, all the material was coded in the language originally used for the interview/focus group (Arabic). Once phase five had been concluded and final themes and illustrative quotes which might be potentially useful for inclusion in the text had been identified, at that stage useful relevant extracts were identified and translated into English by a professional translator who also had access to the original transcript to see these in context.

4.8.7 Phase six: producing the report

When the key themes have been identified and linked to each other, a report can be produced which is no longer purely descriptive in terms of themes but analyses the possible ways in which these themes link to research aims and also to issues which were previously identified in the literature review. In mixed methods research, like this study, this also involves synthesising these results with those obtained from the questionnaire survey (see Chapter Seven).

4.9 Quality of data and measurement

Teddlie and Tashakkori (2009) observe that using mixed methods research (quantitative and qualitative) can represent a significant challenge when assessing the quality of the results obtained from analysis since each research

approach views quality differently and therefore, suggest that the quality of each strand should be assessed separately.

In quantitative studies, two key indicators are typically used to assess research quality: validity and reliability. The former relates to “whether the data represent the constructs they were assumed to capture” whilst the latter is concerned with “whether the data consistently and accurately represent the constructs under examination” (Teddlie and Tashakkori, 2009: 209). In qualitative studies, however, different criteria are considered important. The first of these is referred to as credibility, which Creswell and Miller (2000) define as “how accurately an account represents participants’ realities of the social phenomena and is credible to them”. The second quality indicator is dependability, which focuses on “the extent to which variation in a phenomenon can be tracked or explained consistently using the ‘human instrument’ across different contexts” (Teddlie and Tashakkori, 2009: 209).

4.9.1 The quantitative strand: validity and reliability

Cohen et al. (2007) state that since it is not possible for a research study to achieve perfect validity, it is better to envisage validity as “a matter of degree rather than an absolute state” and to attempt to improve the level of validity of quantitative data through “careful sampling, appropriate instrumentation and appropriate statistical treatment of the data” (Cohen et al., 2007: 33).

4.9.2 The qualitative strand: credibility and dependability

One of the most frequently employed ways to increase the quality of the study is ensure that the research process is made as transparent as possible by providing a clear, detailed and thorough description of all aspects of the study, including the methodology, the sampling design, and the procedures used for analysing text content in order to help the audience draw their own conclusions (Cohen et al., 2007).

As Miller and Glassner (1997) note, methods such as interviews and focus groups as a research method can result in potential bias. Participants may say what they think the interviewer wants to hear due to ‘social desirability bias’, meaning that those taking part in research studies sometimes behave the way they think they are expected to. In addition, as noted earlier, interviewees or focus group participants may respond differently in relation to the identity of the

interviewer or focus group moderator. Therefore, in order to minimise any such bias and maximise the dependability of the two qualitative components of this study, as suggested by Creswell (2008) and Yin (2009), secondary data from multiple sources was used to corroborate evidence gathered from primary sources including different documentary materials provided by the Saudi Ministry and local education authorities, together with data from various international organizations to enhance the credibility of the data and to add deeper levels of understanding of stakeholders' experience of the school food system.

4.10 Research ethics

According to Denzin and Lincoln (2000) research ethics have traditionally centred on three principal areas. The first relates to informed consent meaning that researchers must seek and obtain consent from research participants after they have been carefully and truthfully briefed about the purpose the study in which they will be involved. Secondly, due to the individual's right to privacy researchers must ensure that they protect the identity of any research participants. The third key concern entails protection from harm for all participants. This concept covers all kinds of harm whether this might be physical, emotional or any other type. More recent concerns now include the need to seek permission from participants for storing recorded sound and images and to ensure that there is no covert or hidden recording of them. Ethical concerns may also sometimes relate to issues of positionality or known bias.

After consulting Manchester Metropolitan University Academic Ethical Framework and its Guidelines on Good Research Practice together with the Guidance Note on Ethics and Food-Related Practice produced by the European Commission (2012), the following processes were undertaken to ensure that the research project followed ethical principles:

- Institutional Review Board: The study was approved by the Manchester Metropolitan University Academic Ethics Committee which considered the study's research focus and issues relating to data protection; recruitment of subjects and their involvement in the research; and informed consent.
- Anonymity, privacy and confidentiality: All information collected was

stored on a password-protected university computer with access limited to the researcher. When transcribing the interviews and focus groups, all participants' real names were replaced by alphanumeric codes e.g. first female teacher interviewed at girls' school = TF1.

- Informed consent: All participants were asked to read and sign a consent form and data sheet to indicate their willingness to be interviewed and recorded. It was made clear to participants that the content of the interviews would be used for academic purposes only. In addition, interviewees were informed of their right to withdraw at any stage of the research without suffering any negative consequences as a result of their withdrawal (see Appendices D-F).
- Positionality and bias: This issue has been given consideration earlier in this chapter.

4.11 Conclusion

This chapter presented the methodological considerations which underpin this study. Issues relating to the design of the study were presented including the research paradigm, approach, and strategy. A rationale for the decisions taken regarding the sampling design and scheme was also provided, and the procedures followed for recruiting participants for quantitative and qualitative studies were also detailed.

The chapter also discussed the data collection methods used (questionnaire survey, semi-structured interviews and focus group) and explained how they were designed, piloted, and analysed. The chapter also described the procedures that were followed to enhance the quality of the data and measurement: validity and reliability for the quantitative strand, and credibility and dependability for the qualitative strand. The chapter concluded by describing how ethical concerns had been addressed.

5 Chapter Five: Questionnaire Results

5.1 Introduction

This chapter presents the results of the two questionnaires. As previously noted, one was designed for parents (PQ) with children attending the two state primary schools in Medina (one for boys and one for girls) selected for the study. PQ had four aims:

1. To gain an insight into the eating patterns of the chosen sample of primary school-age children
2. To gain an insight into the types of food which these parents provided for their children in the home and school environment
3. To explore parents' general attitudes towards the current system of school food provision offered in Saudi primary schools.
4. To explore parents' general attitudes towards the desirability and viability of changing the current system of school food provision in Saudi primary schools.

The second questionnaire (TQ) targeted male and female primary school teachers based in the same Saudi city and was designed:

1. To explore teachers' general attitudes towards the current system of school food provision offered in Saudi primary schools.
2. To explore teachers' general attitudes towards the desirability and viability of changing the current system of school food provision in Saudi primary schools.

The findings from these surveys were then explored in further depth using interviews and focus groups, and were also triangulated with some observations made on school visits and documentation. Chapter Seven synthesises the findings from all these areas.

5.2 Profile of respondents to parental questionnaire

Of the 400 questionnaires originally distributed to parents with sons or daughters aged 6-12 years old attending primary schools in Medina, a total of 301 were returned. On the basis of the screening question intended to ensure that respondents were focusing solely on school food provision in the state sector, it was established that five of the completed questionnaires were not

valid for the purposes of this survey. This left a total of 296 valid questionnaires: 146 from parents of pupils attending the selected boys' state primary school, and 149 from parents of those attending girls' school.

Table 5.1 Parental questionnaire sample

Parental Questionnaire			
Boys' School		**Girls' School**	
Distributed	200	Distributed	200
Returned	148	Returned	153
Valid	146	Valid	149
VALID TOTAL: 295			

5.3 Profile of respondents to teachers' questionnaire

Of the 100 questionnaires originally distributed to teachers employed at state primary schools in Medina, a total of 77 were returned. On the basis of the screening question used to ensure that only individuals teaching in state schools were included, it was established that two of the completed questionnaires were not valid for the purposes of this survey. In addition, one further questionnaire had only been partially completed. This left a total of 77 valid questionnaires: 41 from male teachers and 36 from female teachers.

Table 5.2 Teachers' questionnaire sample

Teachers' Questionnaire			
Males		**Females**	
Distributed	50	Distributed	50
Returned	43	Returned	37
Valid	41	Valid	36
VALID TOTAL: 77			

5.4 Descriptive statistics

The opening section of the parental questionnaire (PQ) was intended to provide an insight into the eating habits of primary school-age children in Medina at school and at home.

5.4.1 Eating habits at school

With regards to children's eating behaviour at school, over 90% of respondents have children who purchase food from the school shop, highlighting the important role that this plays in the nutrition of 6-12 year-olds (Table 5.3).

Table 5.3 Children's eating habits at school (*N*=295)

	All parents	Parents		*p*-value
		Boys' School N (%)	Girls' School N (%)	
PQ5: Do your children buy food from the school shop?				
Yes	**275 (93.2)**	133 (45.1)	142 (48.1)	0.15
No	**20 (6.8)**	13 (4.4)	7 (2.4)	
PQ8: Providing children with home-made food to be consumed at school is preferable to giving them money for food from the school shop.				
Yes	**159 (53.9)**	82 (27.8)	77 (26.1)	0.44
No	**136 (46.1)**	64 (21.7)	72 (24.4)	
PQ9: Providing children with home-made food is more difficult than giving them money for food from the school shop.				
Yes	**150 (50.9)**	69 (23.4)	81 (27.5)	0.22
No	**145 (49.2)**	77 (26.1)	68 (23.1)	

Regarding attitudes towards home-made food, opinions were only marginally in favour of this as opposed to buying food from the school shop. Opinions regarding the relative difficulty of providing home-made food for children rather than allowing them to buy their own snacks from the school shop were virtually evenly split (Table 5.3).

Table 5.4 Influence on children's food choices (*N*=295)

	All parents	Parents		p-value
		Boys' School N (%)	Girls' School N (%)	
PQ16: How confident do you feel that you have a positive influence on food choices made by your children when they are in school?				
Not at all confident	**37 (12.5)**	18 (6.1)	19 (6.4)	
A little confident	**88 (29.8)**	39 (13.2)	49 (16.6)	
Fairly Confident	**127 (43.1)**	64 (21.7)	63 (21.4)	0.40
Very Confident	**34 (11.5)**	18 (6.1)	16 (5.4)	
Totally confident	**9 (3.1)**	7 (2.4)	2 (0.7)	

When asked about the levels of influence they think they have over their children's food choices outside the home, just over 57% of respondents felt positive to some degree about their ability to influence what children chose to eat. However, the remainder were considerably less confident about their power to influence what their children were likely to consume in the school environment.

Other items in the questionnaire were used to find out more about the types of food and drink children were provided with for consumption at school.

Respondents were asked to choose from a list of food and drink items provided. Here the results, presented as bar charts (Figures 5.1 and 5.2), are separated out into food and drinks to make them clearer.

The most popular snack food provided for children in this age group reported by parents was the sandwich (Figure 5.1). Biscuits were reported to be more popular than either crisps or fruit. Of two alternatives provided for drinks, juice is the more popular choice for primary school children (Figure 5.2).[20]

Figure 5.1 Snacks typically provided for 6-12 year-olds to take to school

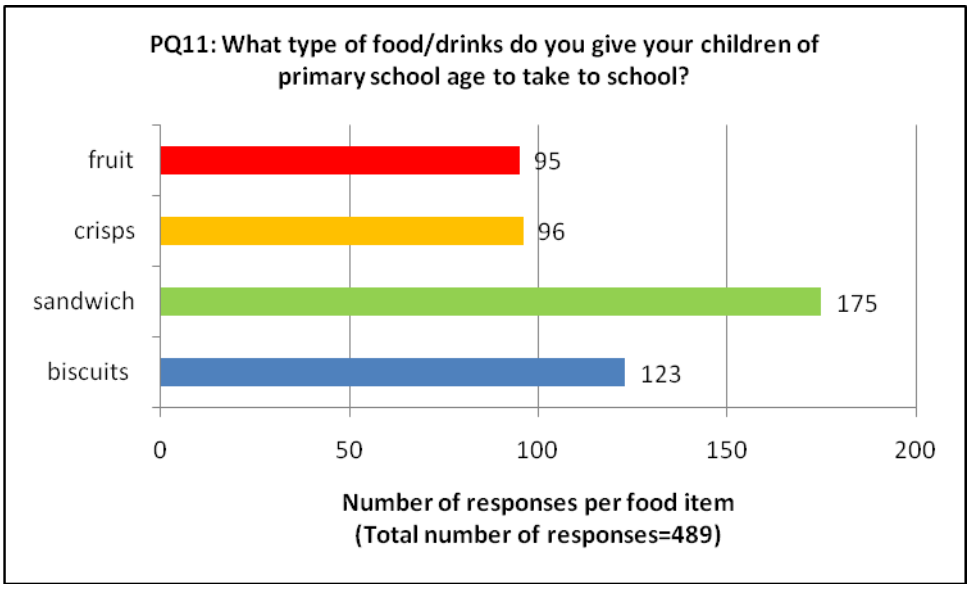
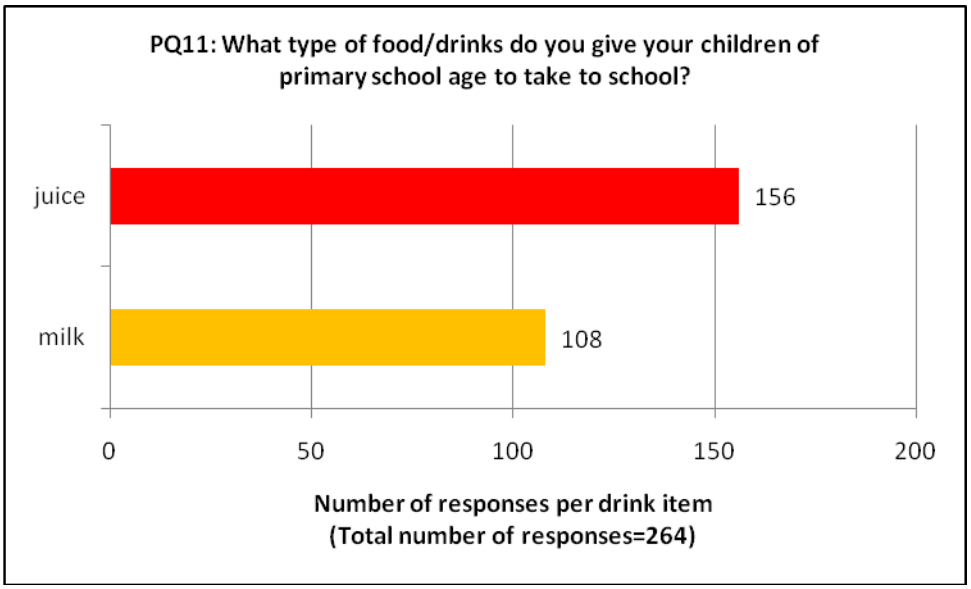


Figure 5.2 Drinks typically provided for 6-12 year-olds to take to school



[20] Current school food regulations in KSA do not allow children to take carbonated drinks or energy drinks to school and bottled water must be available for pupils to buy so only two alternatives were provided on the questionnaire.

5.4.2 Eating habits at home

Parents were also asked to comment on children's eating patterns before and after school and on their consumption of fruit and vegetables as these help to provide a fuller picture of the nutritional profile of 6-12 year-olds. Since the school day starts and finishes much earlier than in the UK, the first meal after school for Saudi pupils is lunch, not the evening meal as would be the case for their British counterparts.

Table 5.5 Children's eating habits at home (N=295)

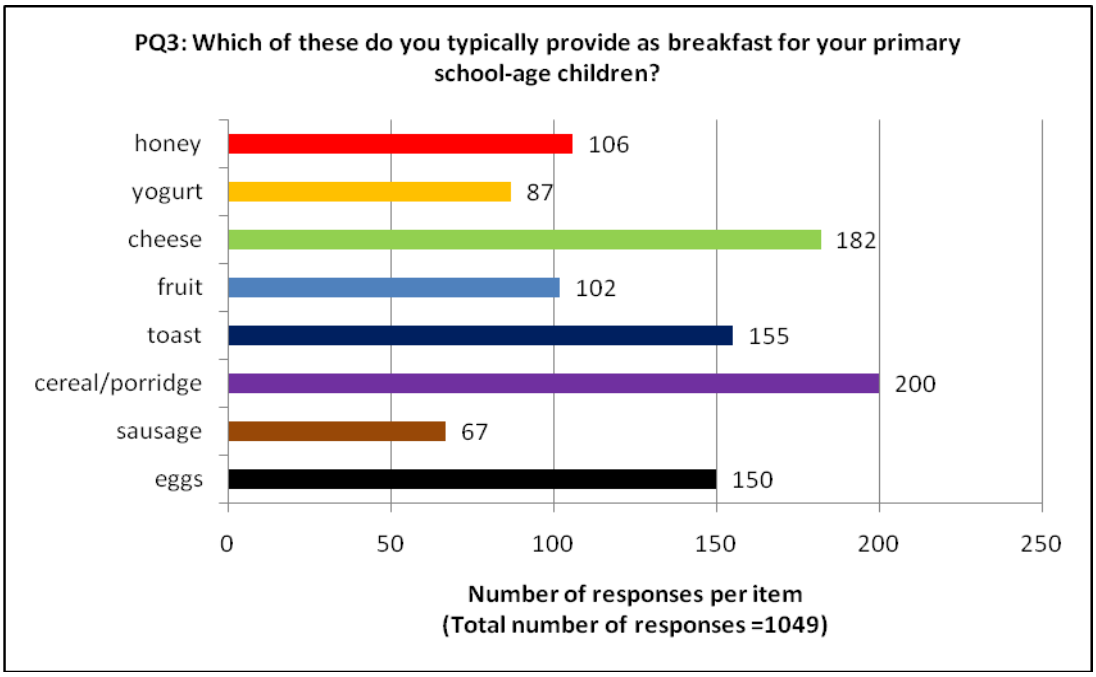
	All parents	Parents		*p*-value
		Boys' School N (%)	Girls' School N (%)	
PQ2: Do your children usually eat breakfast before they go to school?				
Yes	**187 (63.4)**	87 (29.5)	100 (33.9)	0.18
No	**108 (36.6)**	59 (20.0)	49 (16.6)	
PQ13: How many times per week do your children have a home-cooked meal for lunch?				
1 day	**9 (3)**	6 (2.0)	3 (1.0)	
2 days	**15 (5.1)**	8 (2.7)	7 (2.4)	
3 days	**33 (11.1)**	19 (6.4)	14 (4.7)	0.52
4 days	**69 (23.4)**	36 (12.2)	33 (11.2)	
More than 4 days	**169 (57.3)**	77 (26.1)	92 (31.2)	
PQ14: How many portions of fruit and vegetables do your children eat per day?				
1-2 portions	**132 (44.7)**	70 (23.7)	62 (21.0)	
3-4 portions	**121 (41)**	57 (19.3)	64 (21.7)	0.54
5 portions or more	**42 (14.2)**	19 (6.4)	23 (7.8)	

Parental responses show that 63% of 6-12 year-olds usually eat breakfast before leaving for school while nearly 37% do not (Table 5.5). Item PQ3 (Figure 5.3) provided further information about the types of food typically provided by parents for breakfast while another open-ended item PQ4 explored the reasons why children may miss breakfast (Figure 5.7). Back in the home environment after school, responses show that the overwhelming majority of children (over 80%) have a home-cooked meal for lunch four times or more a week (Table 5.5). With regard to fruit and vegetable consumption, over four-fifths of the children (nearly 86%) ate less than the recommended daily intake of five portions or more (Table 5.5).

Two other items in the questionnaire were used to find out more about the types of food and drink children ate between meals at home or were provided with for consumption at school. Respondents were asked to choose from a list of food

and drink items provided. Here the results, presented as bar charts (Figures 5.3-5.6), are separated out into food and drinks to make them clearer.

Figure 5.3 Foods typically consumed by 6-12 year-olds at breakfast



Two of the original categories (cereal and porridge) are combined here, their original respective scores being cereal (n=69) and porridge (n=64). Cheese, toast and eggs were the most popular breakfast items after this joint category. 'Sausage' in KSA is typically a 'hot dog'-type sausage made of processed halal beef or chicken. Honey is one of the foods that has a spiritual value and symbolic importance for Muslims (see section 2.3) and is usually eaten with other food (as a topping on toast or in tea) or on its own, by the spoonful.

Milk (whether plain or flavoured) was by far the most popular breakfast drink for this age group. Tea (usually tea sweetened with sugar and served without milk) was more popular than fruit juice (Figure 5.4).

Figure 5.4 Drinks typically consumed by 6-12 year-olds at breakfast

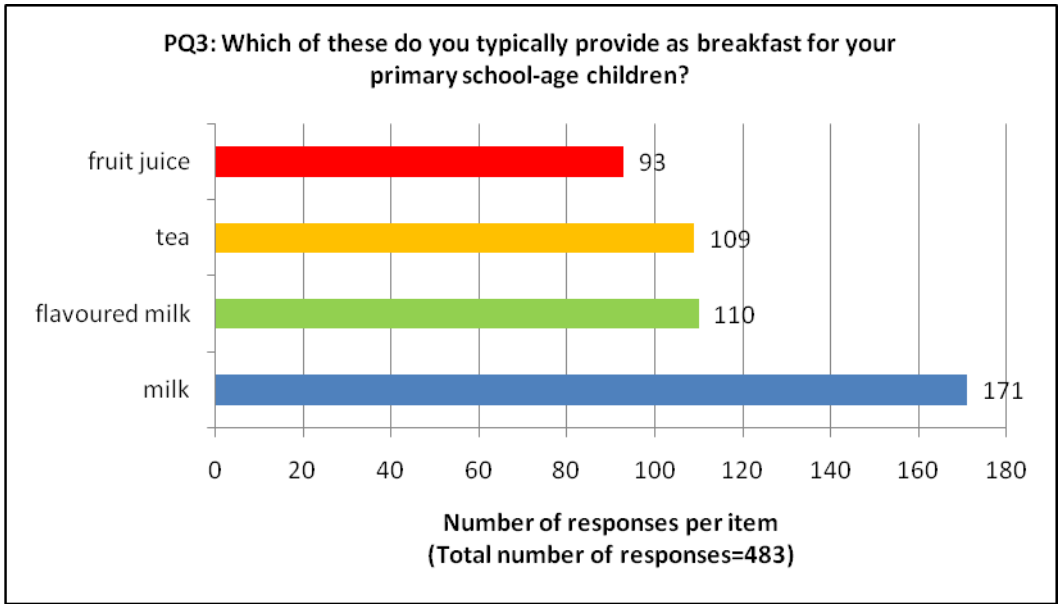
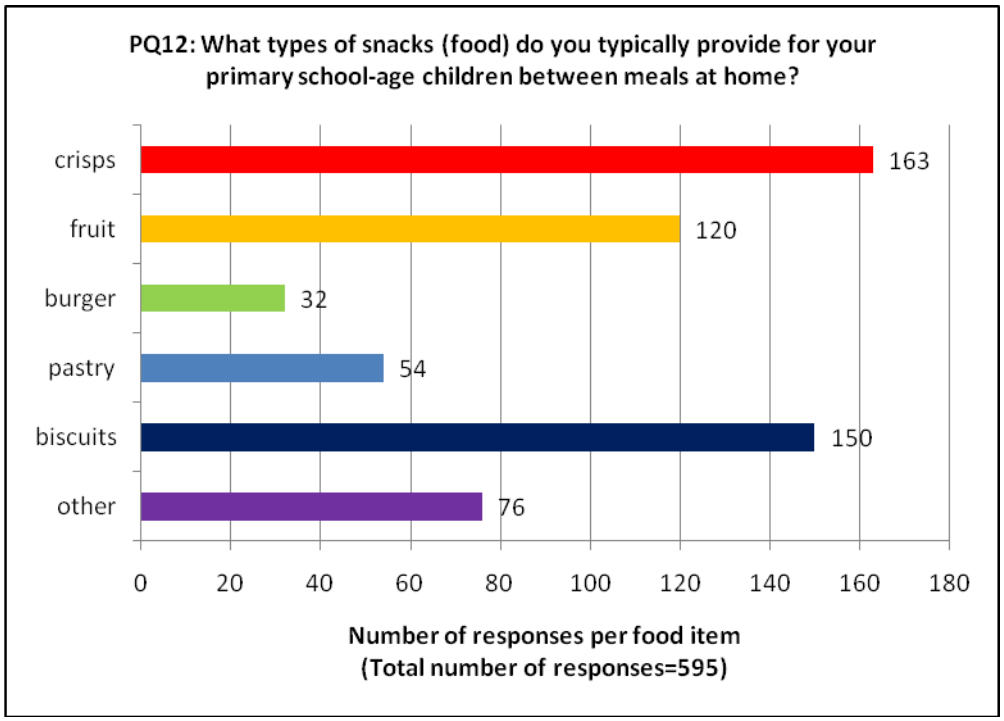
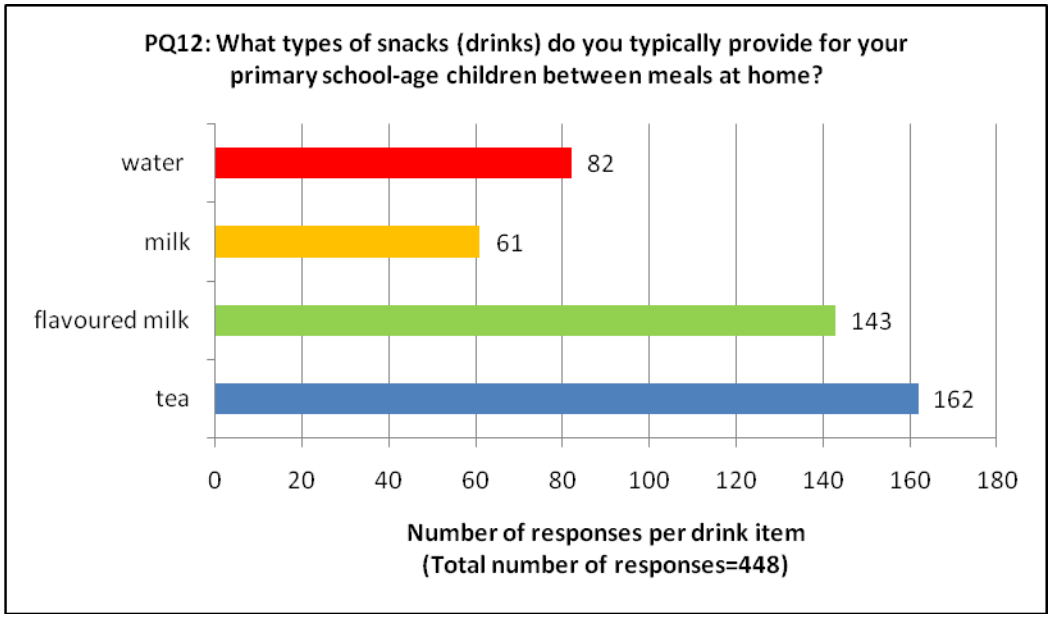


Figure 5.5 Snacks typically consumed by 6-12 year-olds at home



With regard to snacks typically consumed at home, crisps and biscuits were the most popular choices, followed by fruit (Figure 5.5).

Figure 5.6 Drinks typically consumed by 6-12 year-olds at home



In the home setting, tea was most popular, although if the categories of milk and flavoured milk were combined, this would be by far the most popular choice for this age range. Water in the Saudi context invariably refers to the bottled variety (Figure 5.6).

5.5 Attitudes towards the current system of school food provision

Another of the major aims of the questionnaire was to explore and compare the attitudes towards the current system of school food provision in Saudi primary schools from two groups of stakeholders, namely parents and teachers. In addition to gauging stakeholder-specific opinions, a number of items with similar or identical wording appeared in each of the questionnaires to facilitate this comparison.

5.5.1 Broader health benefits of school food

Two of the questionnaire items were designed to establish whether parents and teachers thought that replacing the current system of school food could have a broader impact on children's health.

As Table 5.6 shows, both parents and teachers were overwhelmingly positive about the potential impact of a school meals programme on children's attitudes to healthy eating, with over 90% of both groups agreeing with this statement.

Attitudes concerning whether this would improve the health of schoolchildren were more mixed. While teachers were still overwhelmingly in agreement that

school meals provision would have more general positive health benefits, parents views were more divided. Just over 40% agreed to a greater or lesser extent while 37% disagreed, 20% disagreeing strongly. A further 20% of the parents were not sure.

5.5.2 Perceived importance of nutritional standards

As Table 5.7 illustrates, both stakeholder groups (parents and teachers) were also asked about their views about establishing and regulating minimum nutritional standards for school food to gauge the perceived importance that they placed on this. The vast majority of parents (nearly 78%) and teachers (over 84%) agreed or agreed strongly that the government should make the introduction and regulation of standards a priority. Similar percentages within each group were unsure in each case: just over 10% of parents and 9% of teachers.

Table 5.6 Parent/teacher views on broader health benefits of school food

	All parents (N=295)	Parents		*p*-value	All teachers (N=77)	Teachers		*p*-value
		Boys' School N (%)	Girls' School N (%)			Males N (%)	Females N (%)	
PQ27/TQ16 A school meals programme would have a positive impact on primary school children's attitudes to healthy eating.								
Strongly agree	**160 (54.3)**	79 (26.8)	81 (27.5)		**29 (37.7)**	12 (15.6)	17 (22.1)	
Agree	**119 (40.3)**	59 (20.0)	60 (20.3)		**42 (54.6)**	26(33.8)	16(20.8)	
Disagree	**6 (2)**	3 (1.0)	3 (1.0)	1.00	**5 (6.5)**	3 (3.9)	2(2.6)	0.25
Strongly disagree	**2 (0.6)**	1 (0.3)	1 (0.3)		**0 (0.0)**	0(0.0)	0(0.0)	
Not sure	**8 (2.8)**	4 (1.4)	4 (1.4)		**1 (1.3)**	0 (0.0)	1 (1.3)	
PQ28/TQ17 A school meals programme would improve the health of primary school age children in KSA.								
Strongly agree	**75 (25.4**)	37 (12.5)	38 (12.9)		**38 (49.4)**	16 (20.8)	22 (28.6)	
Agree	**47 (15.1)**	26 (8.8)	21 (7.1)		**36 (46.8)**	24 (31.2)	12 (15.6)	
Disagree	**51 (17.3)**	28 (9.5)	23 (7.8)	0.45	**1 (1.3)**	1 (1.3)	0(0.0)	0.05
Strongly disagree	**59 (20)**	30 (10.2)	29 (9.8)		**0 (0.0)**	0(0.0)	0(0.0)	
Not sure	**63 (20.9)**	25 (8.5)	38 (12.9)		**2 (2.6)**	0 (0.0)	2 (2.6)	

Table 5.7 Parent/teacher views on establishing/regulating nutritional standards for school food

	All parents (N=295)	Parents		*p*-value	All teachers (N=77)	Teachers		*p*-value
		Boys' School N (%)	Girls' School N (%)			Male N (%)	N (%)	
PQ24/TQ13 The government should prioritise the establishment and regulation of minimum nutritional standards for school meals.								
Strongly agree	**115 (38.9)**	60 (20.3)	55 (18.6)		**26 (33.8)**	15 (19.5)	11 (14.3)	
Agree	**115 (39)**	49 (16.6)	66 (22.4)		**39 (50.7)**	20 (26.0)	19 (24.7)	
Disagree	**32 (10.9)**	17 (5.8)	15 (5.1)	0.17	**5 (6.5)**	4 (5.2)	1 (1.3)	0.33
Strongly disagree	**3 (1)**	3 (1.0)	0 (0.0)		**0 (0.0)**	0(0.0)	0(0.0)	
Not sure	**30 (10.2)**	17 (5.8)	13 (4.4)		**7 (9.1)**	2 (2.6)	5 (6.5)	

5.5.3 Changes to current provision

Stakeholders were also asked for their opinions on more specific changes to the current provision of school food, including the type of food which is available and who should provide this.

Table 5.8 Parental views on serving healthy snacks (N=295)

	All parents	Parents		*p*-value
		Boys' School N (%)	Girls' School N (%)	
PQ15: Schools should restrict the type of snacks sold to children to fruit portions only.				
Strongly agree	**192 (65.1)**	93 (31.5)	99 (33.6)	
Agree	**83 (28.1)**	41 (13.9)	42 (14.2)	
Disagree	**6 (2)**	1 (0.3)	5 (1.7)	0.98
Strongly disagree	**2 (0.7)**	2 (0.7)	0 (0.0)	
Not sure	**12 (4.1)**	9 (3.1)	3 (1.0)	

Responses show high levels of support for restrictions being placed on what is available for children to buy at school with over 90% of parents agree with this statement. Some 65% of respondents felt very strongly about this issue (Table 5.8).

With regard to stakeholder views on school facilities for providing school meals, the vast majority of parents and teachers are both supportive of the proposition that schools should build their own catering facilities and employ professionals to prepare meals for children. Nearly 88% of parents are in agreement, and over 81% of teachers. However, a somewhat larger percentage of teachers disagreed with this statement: 13% as opposed to 5% of parents (Table 5.9).

Table 5.9 Parent/teacher views on school facilities for providing school meals

	All parents (N=295)	Parents		*p*-value	All teachers (N=77)	Teachers		*p*-value
		Boys' School N (%)	Girls' School N (%)			N (%)	N (%)	
PQ21/TQ7 Schools should build their own kitchens and canteens so that they can employ catering professionals to prepare meals for their students.								
Strongly agree	**146 (49.5)**	72 (24.4)	74 (25.1)		**35 (45.5)**	21 (27.3)	14 (18.2)	
Agree	**113 (38.3)**	55 (18.6)	58 (19.7)		**28 (36.4)**	11 (14.3)	17 (22.1)	
Disagree	**13 (4.4)**	6 (2.0)	7 (2.4)	0.86	**7 (9.1)**	3 (3.9)	4 (5.2)	0.14
Strongly disagree	**3 (1)**	1 (0.3)	2 (0.7)		**3 (3.9)**	2 (2.6)	1 (1.3)	
Not sure	**20 (6.8)**	12 (4.1)	8 (2.7)		**4 (5.2)**	4 (5.2)	0 (0.0)	

5.6 Desirability of changing current school food provision

The next set of questionnaire items were designed to explore parents' and teachers' attitudes towards the desirability of changing the current provision of school meals in Saudi primary schools, i.e. to gauge whether they would welcome a new system of provision.

Teachers were asked whether they thought changes arising from the introduction of school meals system would be accepted by their colleagues. Nearly 60% were in agreement with this statement while over 28% disagreed to a greater or lesser extent (Table 5.10). There was no statistically significant difference in the views of male and female teachers.

Table 5.10 Teacher views on accepting change from a new school meals system (N=77)

	All teachers	Teachers		*p*-value
		Male N (%)	Female N (%)	
TQ20 Teachers would accept change in the school day arising from the introduction of school meals system				
Strongly agree	**16 (20.8)**	9 (11.7)	7 (9.1)	
Agree	**30 (39)**	15 (19.5)	15 (19.5)	
Disagree	**17 (22.1)**	10 (13.0)	7 (9.1)	0.51
Strongly disagree	**5 (6.5)**	4 (5.2)	1 (1.3)	
Not sure	**9 (11.7)**	3 (3.9)	6 (7.8)	

In addition, the majority of both parents (70%) and teachers (68%) were in agreement that they would welcome the introduction of the provision of cooked meals at primary schools for pupils (Table 5.11). Equal percentages of both groups were in disagreement with this statement (22%). There was no statistically significant difference in the views of male and female teachers.

Table 5.11 Parent/teacher attitudes to changes to current provision

	All parents (N=295)	Parents		*p*-value	All teachers (N=77)	Male	Female	*p*-value
		Boys' School N (%)	Girls' School N (%)			N (%)	N (%)	
PQ6/TQ4 Parents/Teachers would welcome a school meals programme which provides cooked meals for pupils as part of the daily school schedule.								
Strongly agree	**19 (24.7)**	8 (10.4)	11 (14.3)		**22 (28.6)**	12 (15.6)	10 (13.0)	
Agree	**35 (45.5)**	19 (24.7)	16 (20.8)		**30 (39)**	15 (19.5)	15 (19.5)	
Disagree	**10 (13)**	8 (10.4)	2 (2.6)	0.38	**13 (16.9)**	7 (9.1)	6 (7.8)	0.98
Strongly disagree	**7 (9.1)**	3 (3.9)	4 (5.2)		**4 (5.2)**	2 (2.6)	2 (2.6)	
Not sure	**6 (7.8)**	3 (3.9)	3 (3.9)		**8 (10.4)**	5 (6.5)	3 (3.9)	

5.6.1 Financial issues

The questionnaire also examined if parents and teachers thought that a school meals programme should be free to all 6-12 year-olds attending state primary school. This was accompanied by another item which was intended to evaluate stakeholders' views on the prevalence of poverty as measured by whether they thought some families found it difficult to afford the purchase of food from the school shop.

Nearly 89% of the parents surveyed indicated that they thought the Saudi government should reintroduce a school meals programme that would be free to all and over half (56%) of all respondents from this group strongly agreed with this. Over 75% of teachers were also in favour of this proposal. Analysis showed a statistically significant difference in the responses of male and female teachers (Table 5.12).

When asked whether they thought that some families could not afford to buy food from the school shop, similar numbers of both parents and teachers agreed that this was the case, with over 80% from each stakeholder group sharing this opinion (Table 5.12).

One further question served to gauge opinions of parents and teachers on the amount of money that a child should be given per day to purchase food at school. Parents' opinions were fairly evenly divided among the three categories specifying how much money children should be given to buy food at school, with suggested quantities ranging from 2-4 riyals at one extreme (nearly 33%) to 11-15 at the other (over 30%). In the case of the teachers, however, not a single respondent thought children should be given more than 10 riyals per day, and over 57% thought 5-10 riyals was adequate. Analysis showed a statistically significant difference in the responses of male and female teachers (Table 5.12).

Table 5.12 Parental/teacher views on finance and school food provision

	All parents (N=295)	Parents		*p*-value	All teachers (N=77)	Teachers		*p*-value
		Boys' School N (%)	Girls' School N (%)			Male N (%)	Female N (%)	
PQ20/TQ12 The Saudi government should reintroduce the distribution of free meals for primary school students.								
Strongly agree	**166 (56.2)**	83 (28.1)	83 (28.1)		**30 (39)**	13 (16.9)	17 (22.1)	
Agree	**96 (32.5)**	44 (14.9)	52 (17.6)		**28 (36.4)**	14 (18.2)	14 (18.2)	
Disagree	**21 (7.1)**	11 (3.7)	10 (3.4)	0.62	**10 (13)**	7 (9.1)	3 (3.9)	0.03
Strongly disagree	**5 (1.7)**	4 (1.4)	1 (0.3)		**2 (2.6)**	0(0.0)	2 (2.6)	
Not sure	**7 (2.4)**	4 (1.4)	3 (1.0)		**7 (9.1)**	7 (9.1)	0 (0.0)	
PQ17/TQ3 Some families in our community struggle to afford the cost of buying food from the school shop.								
Strongly agree	**100 (33.9)**	53 (18.0)	47 (15.9)		**21 (27.3)**	11 (14.3)	10 (13.0)	
Agree	**140 (47.4)**	70 (23.7)	70 (23.7)		**42 (54.6)**	23 (29.9)	19 (24.7)	
Disagree	**23 (7.8)**	12 (4.1)	11 (3.7)	0.47	**5 (6.5)**	1 (1.3)	4 (5.2)	0.19
Strongly disagree	**5 (1.7)**	2 (0.7)	3 (1.0)		**4 (5.2)**	4 (5.2)	0 (0.0)	
Not sure	**27 (9.2)**	9 (3.1)	18 (6.1)		**5 (6.5)**	2 (2.6)	3 (3.9)	
PQ7/TQ2 On average, how much money do you believe a child should be given to buy food at school each day?								
2-4 Riyals	**96 (32.6)**	56 (19.0)	40 (13.6)		**33 (42.9)**	22 (28.6)	11 (14.3)	
5-10 Riyals	**110 (37.3)**	49 (16.6)	61 (20.7)	0.11	**44 (57.2)**	19 (24.7)	25 (32.5)	0.04
11-15 Riyals	**89 (30.2)**	41 (13.9)	48 (16.3)		**0.0**	0.0	0.0	

5.7 Viability of changing current school food provision

The final set of questionnaire items were intended to assess the attitudes of parents and teachers towards the viability of changing the current system of school food provision. In this case, respondents were being asked whether they thought change would be possible based on their knowledge and experience of the current system in state primary schools, together their perceptions of and attitudes towards those governmental bodies which would be responsible for enacting change.

5.7.1 Perceived preparedness

Parents and teachers were asked if they thought schools had the necessary financial and human resources to implement a new policy on provision of school food for state primary school pupils. This was intended to gauge if stakeholders believed that the current education system was in a sufficient state of preparedness for changes to school food provision.

As Table 5.13, shows, there was a very marked difference in opinions between parents and teachers about the ability of schools to implement a policy relating to provision of school food. Nearly 88% of parents believed that the necessary financial and human resources were available to implement a new policy, and over 47% agreed strongly with the statement.

In the case of teachers, however, less than half (47%) in total supported this statement, with just over 11% expressing strong agreement. Over 31% were in disagreement with the statement and a further 22% stated they were not sure about the state of preparedness of the current system in terms of financial and human resources. In addition, analysis showed a statistically significant difference in the views of male and female teachers

Table 5.13 Parent/teacher views on availability of financial/human resources in current system

	All parents (N=295)	Parents		*p*-value	All teachers (N=77)	Teachers		*p*-value
		Boys' School N (%)	Girls' School N (%)			Male N (%)	Female N (%)	
PQ23/TQ11 Schools have the necessary financial and human resources to implement a new policy on provision of school food for state primary school pupils								
Strongly agree	**140 (47.5)**	68 (23.1)	72 (24.4)		**9 (11.7)**	3 (3.9)	6 (7.8)	
Agree	**118 (40)**	57 (19.3)	61(20.7)		**27 (35.1)**	19 (24.7)	8 (10.4)	
Disagree	**19 (6.5)**	10 (3.4)	9(3.1)	0.88	**18 (23.4)**	12 (15.6)	6 (7.8)	0.02
Strongly disagree	**3 (1)**	2 (0.7)	1(0.3)		**6 (7.8)**	1 (1.3)	5 (6.5)	
Not sure	**15 (5.1)**	9 (3.1)	6(2.0)		**17 (22.1)**	6 (7.8)	11 (14.3)	

Two further questionnaire items were used to specifically gauge teacher views on the state of preparedness of the current system since they were judged to be in a better position to assess this based on their experiences within their own schools. Over 60% of teachers agreed to a greater or lesser extent that Saudi schools had the necessary resources to implement a nutritionally balanced school meals programme that would meet international standards. Analysis showed a statistically significant difference in the views of male and female teachers.

An even higher percentage of respondents from this stakeholder group (over 70%) stated they were fairly, very or totally confident that their own school would be able to prepare, cook and serve high quality, safe meals to students (Table 5.14).

Table 5.14 Teacher views on state of preparedness of current system (N=77)

	All teachers	**Teachers**		***p*-value**
		Male N (%)	**Female N (%)**	
TQ5 Saudi schools have the necessary resources to implement a nutritionally balanced school meals programme that would meet international standards.				
Strongly agree	**11 (14.3)**	4 (5.2)	7 (9.1)	
Agree	**36 (46.8)**	19 (24.7)	17 (22.1)	
Disagree	**18 (23.4)**	7 (9.1)	11 (14.3)	0.04
Strongly disagree	**4 (5.2)**	4 (5.2)	0 (0.0)	
Not sure	**8 (10.4)**	7 (9.1)	1 (1.3)	
TQ6 How confident are you that your school would be able to prepare, cook and serve high quality, safe meals for your students?				
Not at all confident	**9 (11.7)**	7 (9.1)	2 (2.6)	
A little confident	**13 (16.9)**	5 (6.5)	8 (10.4)	
Fairly Confident	**32 (41.6)**	19 (24.7)	13 (16.9)	0.31
Very Confident	**19 (24.7)**	8 (10.4)	11 (14.3)	
Totally confident	**4 (5.2)**	2 (2.6)	2 (2.6)	

5.7.2 Trust in current system

Both parents and teachers were overwhelmingly positive about the capabilities of the Ministry of Education to establish and implement a school meals programme throughout the Kingdom, with over 90% of parents and 70% of teachers agreeing to a greater or lesser extent with this statement (Table 5.15).

5.7.3 Areas of responsibility

Three questionnaire items focused on ascertaining views on which government ministry should be responsible for the different aspects of a new system of school food provision. Two of these were aimed only at teachers as it was believed that they would be better placed to compare whether areas which were currently under the responsibility of the Ministry of Education might be better looked after elsewhere.

Both groups of stakeholders overwhelmingly agreed to a greater or lesser extent that the Ministry of Education (MoE) should establish standards and specifications concerning the nutritional value, hygiene and safety of school meals in primary schools. However, teachers appeared to be more positive about this than parents, with figures of 83% and 65% respectively. Some 15% of parents were unsure about this (Table 5.16).

Teachers were also asked for their opinions about whether the Ministry of Public Health should provide national guidelines concerning hygiene standards for food sold in schools, a responsibility which currently lies within the remit of the MoE. Over 90% of respondents agreed with this statement, over 49% showing strong supporting for this (Table 5.17).

Table 5.15 Parent/teacher levels of trust in current system

	All parents (N=295)	Parents		*p*-value	All teachers (N=77)	Teachers		*p*-value
		Boys' School N (%)	Girls' School N (%)			Male N (%)	Female N (%)	
PQ25/TQ15 The Ministry of Education would be capable of establishing and implementing a national school meals programme.								
Strongly agree	**149 (50.5)**	71 (24.1)	78 (26.4)		**16 (20.8)**	6 (7.8)	10 (13.0)	
Agree	**120 (40.7)**	59 (20.0)	61 (20.7)		**39 (50.7)**	22 (28.6)	17 (22.1)	
Disagree	**9 (3.1)**	5 (1.7)	4 (1.4)	0.53	**7 (9.1)**	3 (3.9)	4 (5.2)	0.54
Strongly disagree	**6 (2)**	5 (1.7)	1 (0.3)		**3 (3.9)**	2 (2.6)	1 (1.3)	
Not sure	**11 (3.7)**	6 (2.0)	5 (1.7)		**12 (15.6)**	8 (10.4)	4 (5.2)	

Table 5.16 Parent/teacher views on Ministry of Education's responsibilities

	All parents (N=295)	Parents		*p*-value	All teachers (N=77)	Teachers		*p*-value
		Boys' School N (%)	Girls' School N (%)			Male N (%)	Female N (%)	
PQ22/TQ14 The Ministry of Education should establish standards and specifications relating to nutritional value, hygiene and safety of school meals in primary schools.								
Strongly agree	**98 (33.3)**	53 (18.0)	45 (15.3)		**27 (35.1)**	11 (14.3)	16 (20.8)	
Agree	**94 (31.8)**	42 (14.2)	52 (17.6)		**37 (48.1)**	21 (27.3)	16 (20.8)	
Disagree	**45 (15.2)**	24 (8.1)	21 (7.1)	0.15	**11 (14.3)**	7 (9.1)	4 (5.2)	0.39
Strongly disagree	**14 (4.8)**	10 (3.4)	4 (1.4)		**1 (1.3)**	1 (1.3)	0 (0.0)	
Not sure	**44 (15)**	17 (5.8)	27 (9.2)		**1 (1.3)**	1 (1.3)	0 (0.0)	

An even higher level of support (96%) was recorded in favour of the Saudi Medicines and Food Authority being responsible for issuing specifications and standards covering nutrition aimed at school students. Over 61% of all respondents stated that they strongly agreed with this statement (Table 5.17).

Table 5.17 Teacher views on areas of responsibility for school food (N=77)

	All teachers	Teachers		*p*-value
		Male N (%)	Female N (%)	
TQ9 The Ministry of Public Health should provide national guidelines concerning hygiene standards for food sold in schools.				
Strongly agree	**38 (49.4)**	19 (24.7	19 (24.7)	0.62
Agree	**34 (44.2)**	18 (23.4)	16 (20.8)	
Disagree	**4 (5.2)**	3 (3.9)	1 (1.3)	
Strongly disagree	**0 (0.0)**	0(0.0)	0(0.0)	
Not sure	**1 (1.3)**	1 (1.3)	0 (0.0)	
TQ10 The Saudi Medicines and Food Authority should issue specifications and standards relating to nutrition aimed at students attending schools.				
Strongly agree	**47 (61.1)**	23 (29.9	24 (31.2)	0.46
Agree	**27 (35.1)**	16 (20.8)	11 (14.3)	
Disagree	**1 (1.3)**	1 (1.3)	0 (0.0)	
Strongly disagree	**1 (1.3)**	0 (0.0)	1 (1.3)	
Not sure	**1 (1.3)**	1 (1.3)	0 (0.0)	

5.7.4 Whole school approach

The final questionnaire item was aimed at gauging parent and teacher attitudes to a school meals programme forming part of a broader programme intended to improve health and nutrition within every state primary school. This item is effectively assessing stakeholders' willingness to embrace what is commonly referred to as a whole school approach to children's health and wellbeing.

Both groups responded positively to this item. Over 90% of parents agreed with this statement, with 55% indicating strong support. Although teachers were also overwhelmingly positive about this statement, with over 70% in agreement, the level of strong support was much lower, with just 20% choosing this option (Table 5.18).

Table 5.18 Parent/teacher views on whole school approach

	All parents (N=295)	Parents		*p*-value	All teachers (N=77)	Teachers		*p*-value
		Boys' School N (%)	Girls' School N (%)			N (%)	N (%)	
PQ26/TQ8 The school meals programme should form part of a broader programme intended to improve health and nutrition within every state primary school.								
Strongly agree	**163 (55.3)**	82 (27.8)	81 (27.5)		**17 (19.5)**	8 (10.4)	7 (9.1)	
Agree	**107 (36.2)**	47 (15.9)	60 (20.3)		**42 (54.6)**	19 (24.7)	23 (29.9)	
Disagree	**11 (3.7)**	8 (2.7)	3 (1.0)	0.29	**7 (9.1)**	5 (6.5)	2 (2.6)	0.45
Strongly disagree	**3 (1)**	2 (0.7)	1 (0.3)		**2 (2.6)**	1 (1.3)	1 (1.3)	
Not sure	**11 (3.8)**	7 (2.4)	4 (1.4)		**11 (14.3)**	8 (10.4)	3 (3.9)	

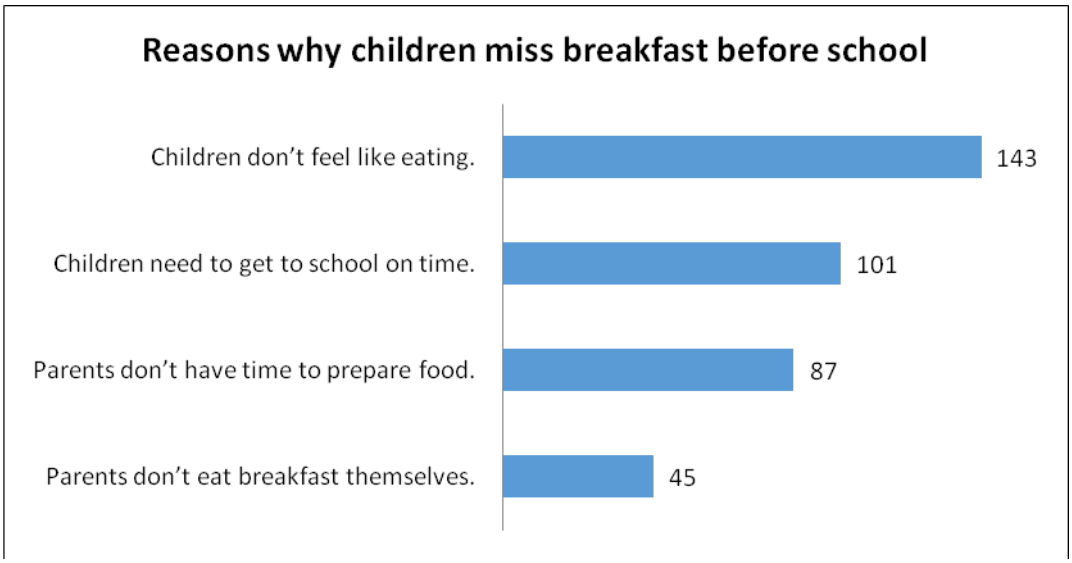
5.8 Analysis of open-ended items

On both the Teachers Questionnaire (TQ) and the Parents' Questionnaire (PQ) some open-ended items were included which were intended to allow respondents to provide further comments on school food provision. The results of the content analysis are presented here and these will be discussed and compared with qualitative data gathered from interviews and focus groups together with existing literature in Chapter Seven.

5.8.1 Eating habits at home

In questionnaire item PQ4, parents were asked to list the reasons why their children might miss breakfast before school, with many listing two or more of the reasons shown in Figure 5.7. Some 80 respondents did not provide any form of response for this item (N=215). The most frequently cited responses were children not feeling like eating because it is too early and they still feel tired, followed by children needing to get to school on time. A smaller number of parents reported that they did not have time to prepare food for children or that they did not eat breakfast themselves.

Figure 5.7 Responses to PQ4

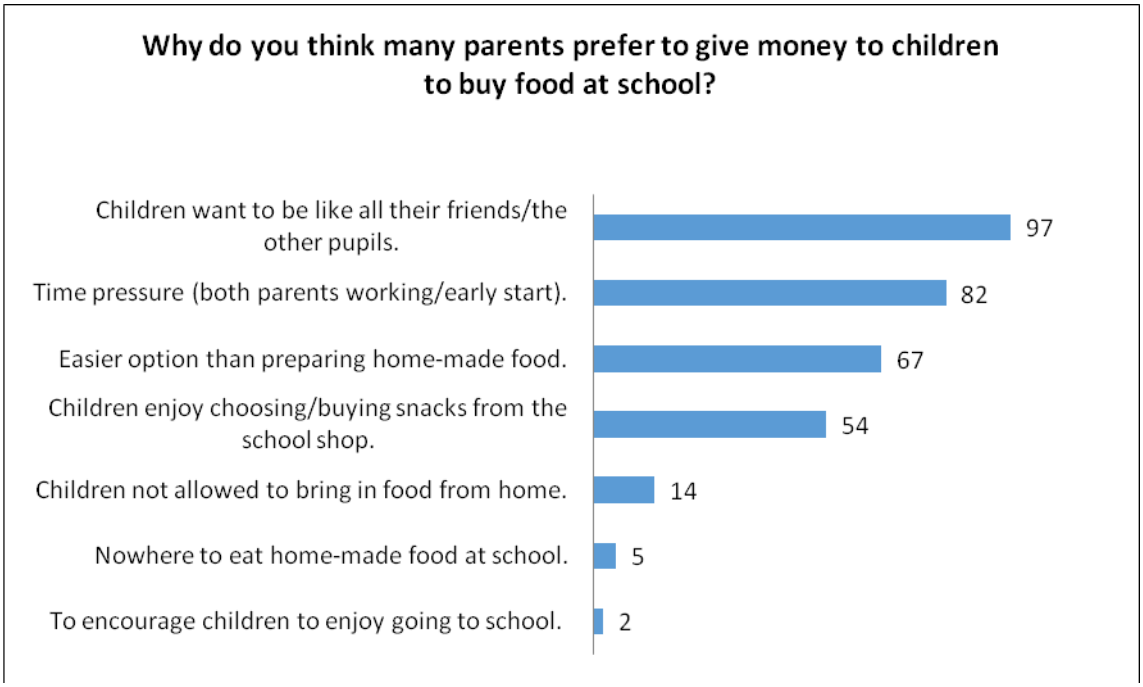


5.8.2 Eating habits at school

Linked to PQ8 and PQ9, PQ10 asked parents why they thought many parents prefer to give money to children to buy food at school rather than providing home-made food. Some 65 respondents did not provide any form of response to this item (N=230). As Figure 5.8 shows, the two most popular responses

related to peer pressure (children) and time pressure (parents). Other common responses showed that buying school food was viewed as an easier option than producing something home-made and also that parents thought children liked choosing what they wanted. Two less frequently cited reasons were schools not allowing children to bring in their own food or not providing adequate facilities for them to eat home-made food. A total of just two parents stated that they gave children money to buy school food as an incentive to attend school.

Figure 5.8 Responses to PQ10



5.8.3 Changes to current provision

The final open-ended question PQ19/TQ19 was used to follow up a questionnaire item which explored stakeholders' attitudes towards changes that could be made to the existing system of school food provision (PQ18/TQ18). Respondents, both parents and teachers, were asked to choose their preference from two options:

- ❒ Option 1: The school should hire a catering company to source, buy, prepare and serve meals to children.
- ❒ Option 2: The school should employ its own catering staff to source, buy, prepare and serve meals to children

As Table 5.19 shows, for both groups of stakeholders, option one i.e. using a catering company was chosen by the majority of respondents.

Table 5.19 Changes to current provision

	All parents (N=295)	Parents		*p*-value	All teachers (N=77)	Teachers		*p*-value
		Boys' School N (%)	Girls' School N (%)			Male N (%)	Female N (%)	
PQ18/TQ18: Which of these options would be your preferred choice? Option 1 or 2								
1	**187 (63.4)**	100 (33.9)	87 (29.5)	0.40	**44 (57.2)**	25 (32.5)	19 (24.7)	0.53
2	**108 (36.6)**	49 (16.6)	59 (20.0)		**33 (42.9)**	22 (28.6)	11 (14.3)	

Respondents were then asked to give their reasons for choosing the option that they had selected and their responses are summarised as bar charts presented in Figures 5.9-5.12.

In the case of option one, the range of responses from both parents and teachers was fairly similar (Figures 5.9 and 5.10). All of the respondents identified at least one reason for choosing option one (parents N=187 and teachers N=44). Of the two most popularly cited reasons, one related to the food itself (better quality/healthier) while the other was a practical consideration, namely, that a lack of school facilities, equipment or space effectively ruled out option two. Two other sets of responses highlighted concerns with the need for expertise in preparing school meals and also ensuring this was safe to consume. However, the latter gained more mentions from both parents (N=59) and teachers (N=9). Both parents and teachers expressed the opinion that using a catering company might help alleviate current problems of congestion etc. caused by the school canteen. Teachers gave one further reason for choosing option one; namely, that it would ease work pressure on school staff.

Figure 5.9 PQ19 Responses to option one (parents)

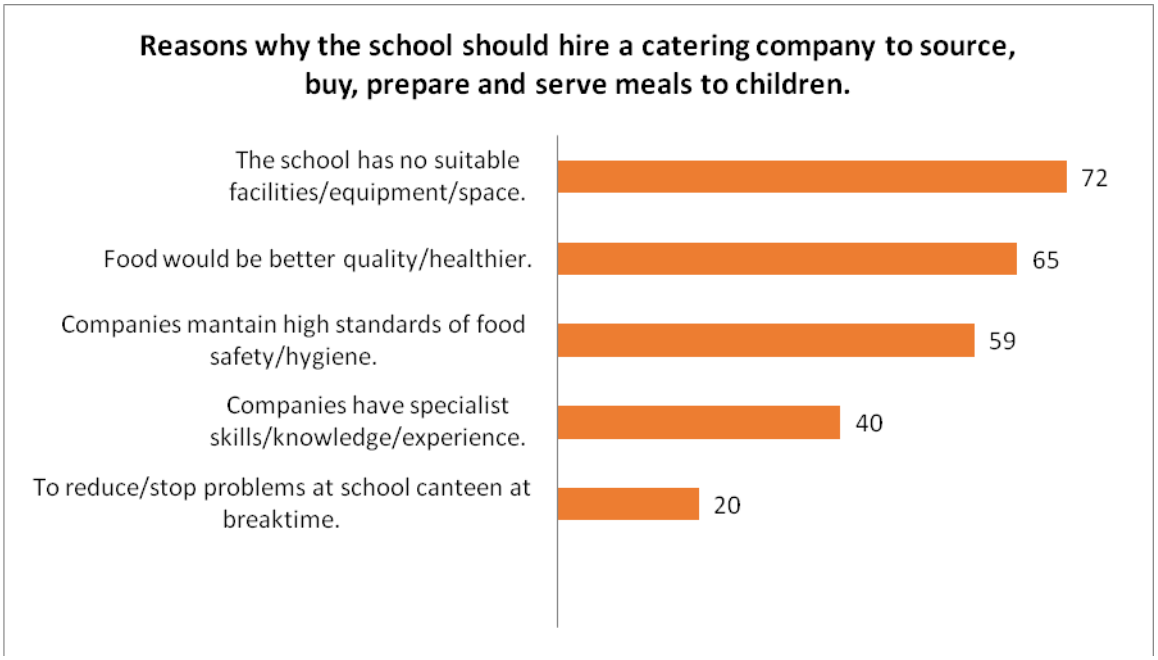
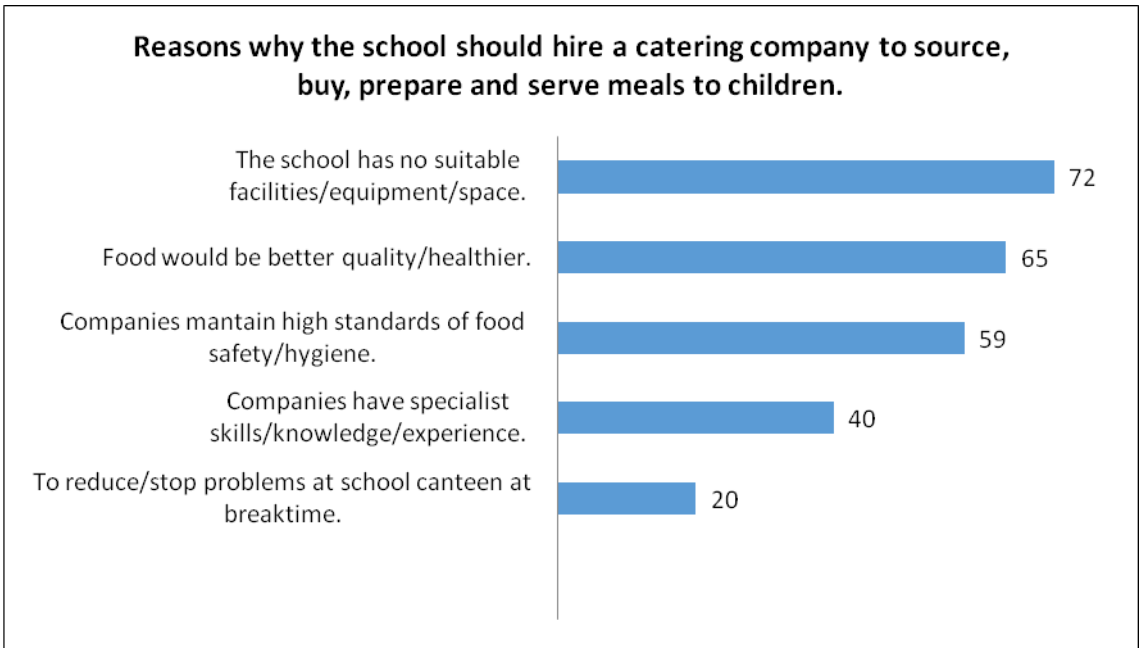


Figure 5.10 TQ19 Responses to option one (teachers)



With regard to option two, there was more variety between the sets of responses provided by parents and teachers (Tables 5.11 and 5.12). As previously, all of the respondents identified at least one reason for choosing option two (parents N=141 and teachers N=33). The most frequently cited reason for both groups was that schools know the needs of their pupils. Some parents specified advantages that they thought this would have for children on the grounds that school staff know about pupils' allergies and health conditions (N=9), the financial situation of their families (N=2) and also their cultural

background (N=1). These respondents argued that knowing this information would make it easier for suitable meals to be provided. Both sets of respondents also mentioned that employing in-house catering staff might bring economic benefits as the food would represent better value for money (parents N=42, teachers N=3) and also that this might have societal benefits in the form of employment opportunities for Saudis (parents N=25, teachers N=7). Both sets of respondents also thought food prepared by the school's own catering staff on the premises would be less likely to cause food poisoning than food from a private company (parents N=10, teachers N=2).

Teachers also gave some other reasons for their choice. Seven teachers said they had chosen option two on the grounds it was similar to the current system. Five teachers also thought it might have educational benefits but did not really specify what they thought these were. Finally, two teachers mentioned avoiding food waste as an advantage offered by this option.

Figure 5.11 PQ19 Responses to option two (parents)

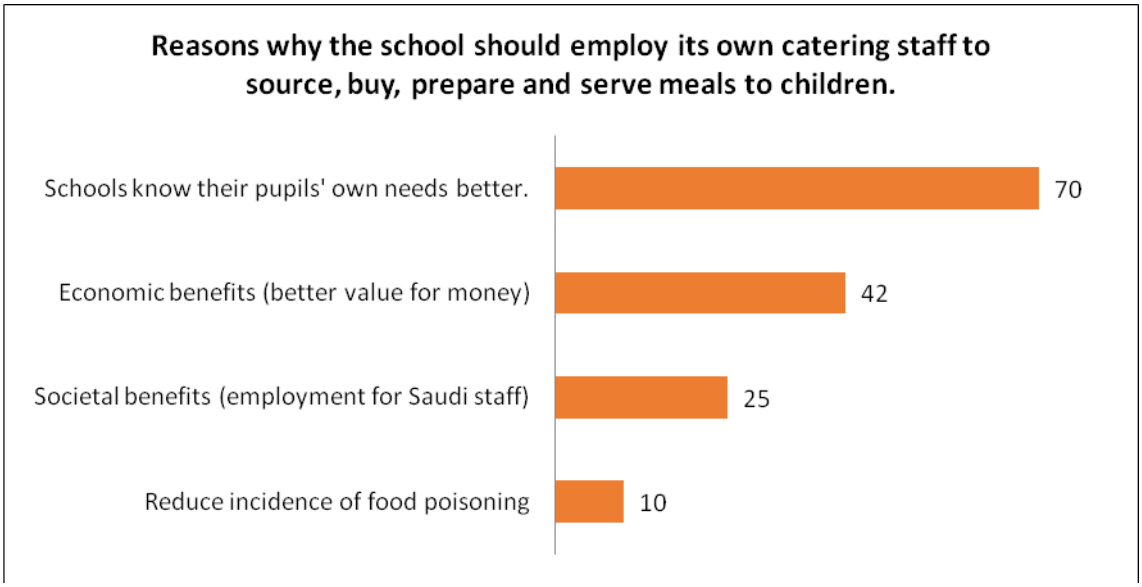
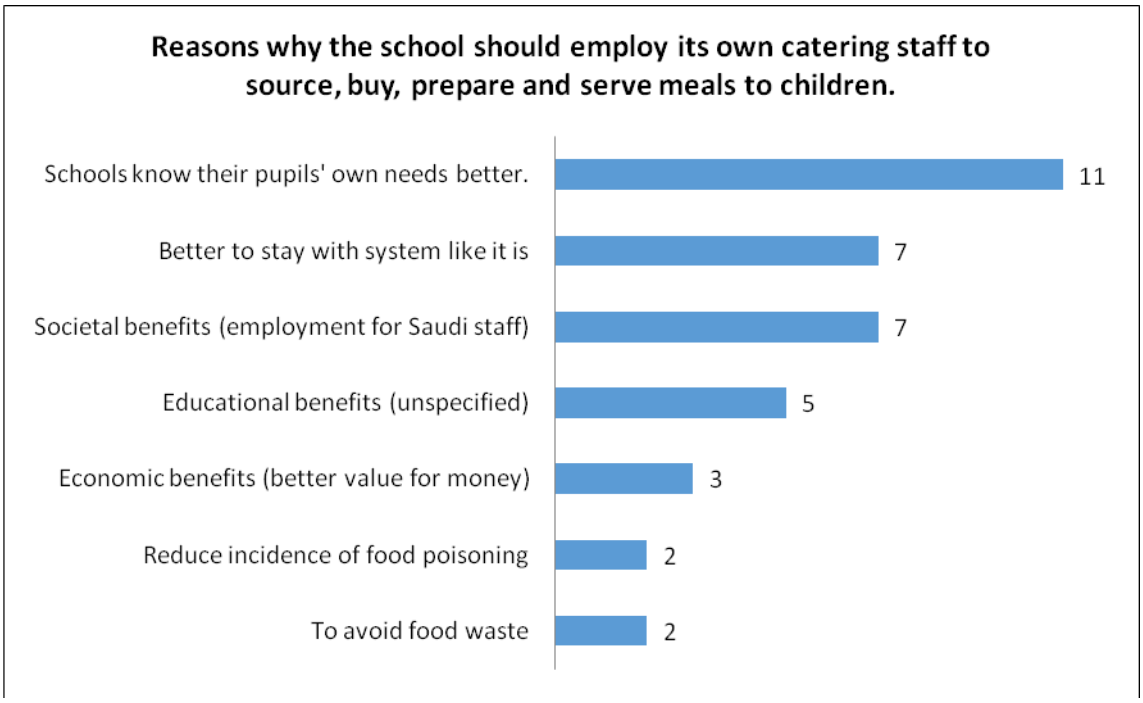


Figure 5.12 TQ19 Responses to option two (teachers)



5.9 Conclusion

This chapter has presented the results for the parental and teachers' questionnaires, designed to explore parents' and teachers' general attitudes towards the current system of school food provision offered in Saudi primary schools and towards the desirability and viability of changing this. The parental questionnaire was also designed to provide insights into the eating patterns of 6-12 year old children attending state primary school In Medina and the types of food which they had access to in the home and school environment. The data from this quantitative component of the study will be synthesised with the findings from the qualitative data from interviews and focus groups in Chapter Seven, and used to address the research questions presented in Chapter One.

6 Chapter Six: Thematic Analysis of Focus Groups and Interviews

6.1 Introduction

Chapter Six presents the results of the analysis of the focus groups and interviews that were used to gather opinions from a sample of parents and teachers from schools in Medina and from officials from the Saudi Ministry of Education concerning the current school canteen system in KSA. Full details concerning the conduct of the focus groups and their composition are provided in Chapter Four. These results have been analysed using a form of thematic analysis, as explained previously in the methodology chapter. In Chapter Seven these findings will then be synthesised with the results from the questionnaires and triangulated with observation and existing literature.

6.2 Thematic analysis of the fathers' focus group

The content analysis section will begin by presenting the results of the fathers' focus group, then the mothers' focus group and then the first comparative analysis of these two groups. This will be followed by the results of the teachers' perspectives (based on the combined results of the focus groups of teachers at boys and girls primary schools).

6.2.1 Opinions about school canteen food

All four of the participants expressed negative views about school food in terms of the level of nutritional value it provided. Two of the fathers expressed unreservedly negative opinions about the current food that was on sale in school canteens. According to P1M "*most of what is sold for children in the canteens is awful awful stuff"* and "*doesn't take into account at all the health of students, what is good food for them*" [P1M] whilst [P4M] twice dismissed all school food as being *"unhealthy"*. P3M was not so totally negative but thought that "*a lot of the sweets and the food that they sell are not good to give to our children*" [P3M].

Two of the fathers made direct links between the type of food being sold in the school canteen and broader health problems in the Kingdom:

> *We've all seen the stories on the TV about Saudi children with diabetes and… with bad teeth and* [OVERLAPS] [P3M]

And don't forget all the reports about obesity levels! [P1M]

This also links to another theme that emerged from this focus group: the role that media (and particularly social media) play in raising levels of awareness about nutrition and health in KSA (see 6.2.4).

Only one of the focus group participants in the fathers' group made any recommendations concerning the specific types of food that could be offered for sale at the school canteen to replace the current items, with P3M referring to milk as a cheap and healthy food that could be sold. However, comments made by both P1M and P4M suggested they felt uncertain about what would actually constitute healthy food for school children:

> *I thought juice, I thought fruit juice was good for kids? It's natural, isn't it? My kids drink lots of orange juice. It must be better than… surely, it must be better than Pepsi? It must be* […] P1M
>
> *But at least it's meat* [A REFERENCE TO THE SAUSAGES AND BURGERS THAT HAD BEEN CRITICISED BY P2M] – *isn't that better than*… P4M

One father [P2M] had very strong ideas about what school food should ideally be like and what purposes it should serve:

> *What kids eat at school is important if you want them to grow up healthy and strong.* [P2M]
>
> *I think the school canteen is an important part of the whole educational process.* [P2M]
>
> *I would hope that we as a country could ensure the best food and most suitable food for students was served in our school canteens.* [P2M]

The same participant [P2M] was also very clear about what he thought was acceptable in terms of food to be served in the school canteen. He had complained when sausages and burgers were served in his son's school arguing that "*that kind of American food*" [P2M] should not be served to children. This may suggest a rejection of this food not only on health grounds but also on the grounds of it being culturally inappropriate.

In general, participants in the fathers' focus group thought the food currently on offer in school canteens was not acceptable, being unhealthy, poor quality [P4M, P2M, P3M] and "*full of sugar and … and nothing else"* [P1M] but they seemed uncertain about exactly what this should be replaced with and only one felt reasonably confident about suggesting a specific alternative that would be

better nutritionally than what was currently on offer. This may indicate that whilst fathers are aware of what is problematic in nutritional terms they seem to be much less confident in terms of their knowledge about healthier dietary options for their children.

6.2.2 The importance of breakfast

As was previously the case with opinions expressed in the open questions from the parent questionnaires, fathers thought that breakfast should play an important role in children's nutrition:

> *Children need it, don't they, to start the day?* [P2M]
>
> *I think children should have breakfast* [P2M]

But there was also an admission that there was a gap between what they visualised as the ideal situation regarding breakfast and the reality of their own daily family routine:

> *My sons won't eat a meal or sandwich in the morning before school* [P3M]
>
> *I know my kids they won't eat anything, nothing at all early in the morning before school…* [P1M]
>
> *If **I*** [EMPHASISES] *could only get **my*** [EMPHASISES] *children to eat breakfast* [P2M]

This emphasises that school food is actually much more than a snack and may well represent the first meal of the day for primary school children. Fathers were clearly aware of this fact and connected this directly with the bad behaviour of boys waiting to buy food from the school canteen, reasoning that by the time it came to taking their break in the morning the children were probably feeling hungry [P4M, P3M, P1M] and were ready to eat.

A potentially interesting link here can also be made to a possible knock-on effect of this lack of adequate nutrition from the school canteen which fails to provide an adequate first meal for children. One of the fathers observed that as a result of not being able to buy anything to eat anything at school his children were always "*asking me if we can go and get something to eat when they come out of school*" [P3M]. In such a scenario the chances are that this would refer to a trip to one of the many fast-food chains available in Medina such as

McDonalds, or their Saudi equivalent Herfy[21] or Kudu[22] (mentioned by P2M), suggesting that a poor nutritional start to the day may continue with further bad eating habits.

6.2.3 Mothers, fathers and responsibility for healthy eating

Reflections by P2M on breakfast confirmed that changes to some aspects of Saudi society have also changed nutritional patterns within the family. Whilst this participant remembered "*My mother always used to make us all eat something before we went to school*" [P2M] he acknowledges that since his own wife is a working mother although she "*tries really hard*" due to time pressure the family routine does not usually include breakfast:

> *I always feel guilty because I know fathers and mothers should act as role models for children but we, me and my wife, we just don't have time for breakfast either. We try to get into a daily routine but it's just… it just doesn't happen* [P2M].

This father's [P2M] remarks suggests that he feels he shares some sense of responsibility in failing to enforce a healthy breakfast routine for the family.

Generally, though, remarks by participants in the fathers' focus group suggested that despite these social changes regarding gender roles in terms of women working outside the home, in their role as mothers, women were still associated with not only providing food for children but also for encouraging them to eat in a way that was judged to be healthy. The fathers acknowledged that they thought this task was a difficult one:

> *My wife finds it really difficult to get them… she's always complaining about trying to get them to drink water or milk* [P4M]
>
> *When my sons won't eat a meal or sandwich in the morning before school at least my wife can try to get them to drink some milk*. [P3M]

P2M notes that his wife is the one who buys the lunchbox for their daughter that is intended to be used for taking homemade food to school and she also takes responsibility for filling it up "with nice things to eat". He also noted that their children targeted their mother when asking for particular food products to be purchased:

[21] Herfy describes itself as "the Kingdom's biggest and most successful fast food brand, dominating the Saudi market". It has a 'Kids Club' and offers the equivalent of McDonalds Happy Meals with toy promotions that are aimed at young children http://www.herfy.com/en/about.php Accessed on: 9/6/2016.

[22] Kudu also offers kids meals http:www.kudu.com.sa/ar Accessed on: 9/6/2016.

The kids are always saying "Mum, mum… please buy us this new milk with banana flavour" or "Mummy, we want these biscuits and then we promise we'll eat it for breakfast" but that lasts for a week or so and then… they never do… [P2M]

Another participant [P1M] noted that it was his wife who alerted him to information about nutritional matters as a result of what she read on social media.

In general terms, although the fathers accepted that they had a role to play in children's healthy eating, mothers were still recognised as playing the key role in matters relating to nutrition within the household.

6.2.4 Sources of information about the school canteen

Unlike the educational system in the UK, for example, where schools are expected to view parents as stakeholders and to involve them actively in decisions concerning such issues as the food served at school, in KSA, this tradition does not exist in the public sector. In addition, parents do not have a clear means of making their voice heard on educational issues since there is no equivalent of such thing as parental representation by means of a Parent-Teachers Association or a representative on a Board of Governors. However, comments from the fathers' group make it clear that despite this they have formed strong opinions about the school canteen system and its shortcomings so it is worth exploring how they formed these opinions.

One of the fathers commented:

I don't think a lot of parents really know what is on offer in the school canteen at the moment. I certainly don't know exactly other than what my kids tell me… P2M

Analysis of the responses from the group showed that children themselves played a major role in alerting parents to what happens in the school canteen, and whether they view this as positive or negative from their own perspective, emphasising the importance that this break from the classroom activities for food plays in their daily routine:

When my son told me about the problems [P3M]
My kids are always telling me [P3M]
My lad says that too [P2M]:
What my son always, always complains about [P4M]

My son came home one day and he was really excited because he told me [P2M]

Comments of this type suggested that these fathers clearly listened to their children and appeared to have picked up a lot of information concerning what types of food were on offer, what their children's favourite snacks were, and what the major problems with existing provision were from the children's point of view. When asked to reflect on the problems of the current system of school canteens, fathers P2M, P3M and P4M all talked at length and in detail about the problems with the school canteen system from the child's point of view, suggesting that their children had brought up these issues with them on repeated occasions:

P4M: *what my son always, always complains about in relation to the school canteen is that it's always such a short break period they get at school… and that means* [OVERLAPS]

P4M: *[...] there are so many students, too many students. […] just too many hungry boys to get served all at once; […] they're all standing around, squashed together in a small small space; […] they're all pushing and shoving each other […] .*

P2M: *Yes, yes - my lad says that too. He told me some of the big ones, the bigger lads, just push their way through the little kids, they just elbow them out of the way- OOOF- like that* [DEMONSTRATES HITTING SOMEONE WITH ELBOWS]. *There's always trouble, with fights breaking out. […]*

P3M: *[…] there's no control in the front of the window where children buy their snacks at the shops. When my son told me about the problems I asked him: "What about the teachers? Where are your teachers? Isn't there anybody there doing anything, I mean, doesn't anyone control things there, make sure that everyone gets to buy what they want? […]*

P2M: *Numbers are really high… 900 students in my sons' school and it's still getting bigger and bigger… […]*

P3M: *No wonder my kids are always telling me that they couldn't get anything to eat today at school and asking me if we can go and get something to eat when they come out of school!*

Fathers appear to have a vivid insight in the key issues from the child's point of view: excessive numbers of students and a short break time mean overcrowding and the lack of control by teachers or enforcement of any queuing system leads to violence and means some children go without any food. However, children of primary school age clearly do not have the same concerns

as their parents do about other aspects of the school canteen so it is important to consider what other sources of information may be available for parents wanting to know more about the adequacy of the food made available to their children.

Analysis of the fathers' comments revealed that social media, in particular Twitter and Instagram, may play an important role as a source of information for parents alerting them to potential problems with food served in school. Sometimes these are postings about unhealthy products such as sugary drinks [P3M] or the contents of sweets that are on sale [P1M] but they also point to issues concerning food safety:

> *Parents and teachers are always sharing photos of erm… green sandwiches and pastries on Instagram I mean green because they are covered in mould* [P4M][23]

It is interesting to note P4M's comments about teachers also using social media to pass on information about food safety problems on their own initiative.

More generally, television [P3M] and the internet [P3M] were cited as sources of information about nutrition and health but one participant highlighted a potential difficulty with the internet: "*There's **too much** [FROWNS] information, it's confusing"* [P1M]. This perhaps ties into the previous observation that fathers did not feel confident about expressing opinions about healthy food stuffs that should be on sale in the school canteen because they themselves lack knowledge.

Some comments by focus group participants suggested that parents have only limited information about some key aspects relating to the school canteen such as existing guidelines concerning prohibited food stuffs and how the canteen is regulated in terms of food safety and hygiene. Discussing the topic of soft drinks, three of the fathers showed that they were aware of the guidelines that prohibited the sale of these in school canteens:

> P4M: *I know that soft drinks like Pepsi is banned in schools […]*
>
> P2M: *Well, yes, in theory, in theory they're banned. I'm not sure that's the way it works in practice though really! Because I'm sure, I'm almost*

[23] The sandwiches and pastries referred to here are usually commercially produced in factories and wrapped in plastic but quickly deteriorate if stored inappropriately in school canteens. Problems are sometimes also caused by plastic wrapping being damaged.

certain I've heard my kids talking about buying that kind of fizzy drink, that Pepsi or whatever, at school:

P3M: *I don't think they let them have it at school, though now. Not fizzy drinks, not any more […]*

It was noticeable however that P2M draws a distinction between theory and practice and is not convinced that the guidelines are followed. This lack of trust was a key theme that was voiced repeatedly by members of the focus group and will be examined in more detail later (see 6.2.6). Although P3M does not make the same theory/practice distinction as P2M regarding the application of the guidelines, he does not seem to be completely certain about what the current position is.

There is also evidence that at least one of the fathers was wholly unaware that a system of school canteen inspection existed:

P2M: *And they told me that if there is a problem like that at the school then the school canteen inspector would have to report it! But I ask you, how often does the school canteen inspector visit? How often?*

P1M: *I never even heard about…* [OVERLAPS]

6.2.5 Making one's voice heard

There was one example that illustrated the difficulties that Saudi parents face in voicing their opinions regarding the current system of school canteens given the lack of formal existing structures that allow them to complain. One of the fathers [P2M] was very angry when he found out that his son's school had started selling sausages and burgers at break time to children and decided that something needed to be done:

I went directly to speak to the Education Department here in Medina, I went to the administration there and I told them right to their face: "Shame on you! Shame on you people for feeding to our children that kind of… that kind of American food" [P2M][24]

However, he was simply told that the responsibility lay elsewhere and that the problem needed to be reported by the school canteen inspector. This incident highlights that there are a number of problems with the current system in terms of regulation, monitoring, transparency and accountability. This may also explain why so many parents and teachers choose to complain and share

[24] As previously noted, by referring to American food, it is unclear if P2M was concerned about this being unhealthy or felt that it was culturally inappropriate.

information using social media rather than attempting to engage with a school canteen system in which are not expected or encouraged to taken an active interest in their children's nutrition.

6.2.6 Problems with the current system

The most frequently made complaint from the fathers' group was the cost of the food that is available in the current system of school canteens and whilst none of the participants spoke openly about their own financial difficulties they were clearly aware that the prices that were charged in the school canteen might represent a significant financial burden for some families:

> *It's sure to be a big headache for some families […] those with… with four or five children, all wanting their own money to spend… [SHAKES HEAD] that would be really bad, very difficult for the family budget* P4M

> *There's not even a single thought for all those, all those families who don't have… who have to try to exist with only a low income to spend.* P1M

However, it was not simply the cost of the products that fathers found unacceptable but also the fact that in addition to the high cost, the quality of the products on sale was not good, making them poor value for money [P2M, P4M].

The issue that all the fathers agreed on and felt most strongly about was what they perceived as the use of the school canteen being used to generate financial profits, without caring about the bad effects this might have on children's health. Their opinions varied somewhat in terms of whom they thought was actually benefiting from those profits. P1M thought it was schools in general:

> *I still think the most important thing for many of the schools is the daily income from the school canteen – they're not interested in having any responsibility for the health of their students. They're interested most of all in profit* P1M

P4M, however, refers to teachers as being beneficiaries of the current system:

> *The school canteen is run by just a small group of staff at the school who bring in cheap products, biscuits and sweets that are… are poor quality, and then they sell them to the children at the school at the highest prices possible […] the staff at the school, the teachers, they're the only one who benefit from the school canteen* P4M

P3M was more cautious in his opinion but highlighted the fact that in the present system where the school canteen is run by a single operator "*there's too much potential for… for abuses*" [P3M]. He did not explain exactly what he meant by this.

It was very clear that the major underlying problem as far as this group was concerned was that they had a lack of trust in every aspect of the current school canteen system. Although they understood that regulation of the school canteen existed, two of the fathers openly questioned whether there was any actual enforcement of this. As previously noted referring to fizzy drinks, P2M observed that "*in theory they're banned. I'm not sure that's the way it works in practice though really!"* [P2M]. In addition, P4M was also sceptical about the effectiveness of regulation:

> *It doesn't matter what the management requirement is because I don't think they apply any regulations. Otherwise, how could there be a school selling fast food?* P4M

In the opinion of P2M:

> *The school canteen system at the moment is bad in so many ways and […] the main victims of that are the students, the students that are also our children.* P2M

His comment not only highlights the fact that there are multiple problems with the Saudi school canteen system but also points to the fact that parents need to have a say in something that directly impacts upon their children.

Whilst the point was not made directly by any of the fathers, analysis suggests that these participants saw children as being able to be easily exploited by the current system for a number of reasons. Firstly their age meant that they were not aware of the potential harm that could result from the poor nutrition offered by the school canteen and not varying their diet:

> *Most children don't realize that it's not good, it's not healthy to keep eating just sweets and crisps all the time, every day […] why would they know any better than eating sweets*? P1M

Once children have been given their money to spend, it is clear that they can buy "whatever they want to spend their *riyals* on" [P4M] since there are no controls in operation at the school canteen. As the same father noted, that

meant "*my kid has those wrapped fateera tasbeerah*[25] *every single day at school…".*

Secondly, children can be easily influenced as consumers. P1M noted how the sweets they sell in school "*all look so bright and colourful they really appeal to little kids*" [P1M]. P2M also brought up the issue of how companies like *Asir Al Rabie* deliberately target children with television advertising:

> *My little daughter loved that advert with the cartoon about kids like explorers in the jungle and all the fruit comes to life* [P2M]

The same father notes that his daughter is even able to specify the brand of pastry she plans to buy with her money for the school canteen "*two more* [*riyals*] *for a Lusine pastry*!"

Thirdly there is strong evidence that even at primary school children are subject to peer pressure when it comes to the food they choose to eat at school. P2M recounts the story of attempts by him and his wife to encourage their daughter to take homemade food with her when she first started school:

> *After just one week at school my daughter came to us and told us: "Mummy, Daddy, please, please, no more lunchbox with food from home. I want to buy my food from the school canteen like all the other girls do! Everyone buys biscuits and sandwiches at the canteen." She seemed like she was really… she got really upset about it so I admit that I'm sorry to say we just… we just gave in and stopped the lunchbox and she seemed very happy again and didn't say anything else* P2M

Another of the fathers had had similar experiences:

> *Forget about the idea of taking food from home. You won't ever win that argument […] that's what the kids want because that's what their friends eat. No child wants to be different, you know how it is* [P1M].

6.2.7 Possible solutions

In terms of possible solutions, one practical suggestion that was made was to ensure that all parents were made aware of what was being sold at the school canteen:

> *Those officials who work in the Education Department should force all the schools, particularly every single school, state or private, to send out*

[25] In the Saudi context, *fateera* or *fateera tasbeerah* this can refer to either a filled filo pastry or to an unleavened bread, resembling pitta bread, with a filling.

> *to parents a list of all of the products that they have for offer on sale at the school canteen* [P3M]

This was followed up by P4M who said that schools should also be obliged "to list what the prices are of all the products that are on sale in the canteen" in order "to prevent the kind of… the kind of abuses that go on" [P4M].

P2M approved of these suggestions and thought this would improve the quality of the products on sale if parents saw what was on offer for their children to buy and might also stop school from overcharging.

Given what was said about a lack of trust, it is perhaps not surprising that the need for monitoring of even this basic process was stressed by P3M:

> *I'm not sure that a list of that kind would work without carefully monitoring the school canteen to ensure it provides healthy food because they could provide things that aren't on the list, couldn't they? […] we definitely need monitoring* [P3M]

P2M talked in more general terms:

> *Schools definitely need someone to be overseeing what is going on in the canteen, someone checking and controlling everything*. [P2M]

In theory, this is exactly the system which already operates via the school canteen inspector but as previous responses showed, parents are either not aware of this system or feel it is ineffective.

In terms of involvement by the Ministry of Education and the idea of taking a more centralised approach to the school food system, opinion varied. Two of the fathers thought the Ministry might have a role to play but in quite different ways. P1M thought the best solution would be:

> *To keep the school in charge of the school canteen but to get the Ministry to employ the canteen staff and get them to pay their salary. That way, those employees are responsible to the Ministry if anything goes wrong and…* the Ministry could tell them "you must ensure the prices are affordable for everyone". [P1M]

Although this is not specifically mentioned, the suggestion here seems to be that this would bring a degree of accountability into the system and whilst his suggestion offers a kind of solution to the price issue raised by the participants it does not seem to address specifically the health concerns raised earlier about the food on offer.

P2M's opinion was different:

> *The Ministry should hand over the school canteens to a God-fearing company and impose conditions that mean the food would be more healthy food.* [P2M]

This solution stresses the need for the Ministry to control and regulate the school canteen system and seems to imply that one private company should assume responsibility for the whole system rather than the current system of each school contracting a local company. His use of the word 'God-fearing' suggests that he believes the current companies are not honest in their dealings.

P3M was unclear what role the Ministry would be able to play in the provision of school canteen food and approached the issue differently, focusing instead on changing attitudes about food:

> *We need professionals in state schools to explain about what proper meals are for the students; what I mean is, people like… people who are trained to know about what children need to eat and specialists who have training and education and can encourage kids to eat healthy food to stop them from getting ill when they are still so young. So yes, we definitely need monitoring but Saudi schools need more about… about…* [TRIES TO THINK OF THE RIGHT WORD] *about having health awareness, about promoting being healthy.* [P3M]

In his solution, P3M places emphasis on having a nutritionist involved in the school canteen and an earlier comment he made suggests that the nutritionist would play a role in monitoring what is on offer. He also stresses the need for there to be health education and promotion of healthy lifestyles that would help to change children's attitudes to eating. This was clearly a topic about which this father felt strongly since he had previously commented:

> *If someone doesn't do something soon this generation will turn into a health disaster* [P3M].

6.3 Thematic analysis of the mothers' focus group

Five participants (referred to as P1F, P2F, P3F, P4F, P5F) formed the focus group. Many of their comments were based on direct experience only of their daughters' schools due to the gender segregation system in KSA but they also referred to their sons' experience at school based on what they had been told at home and, as will be explored later, unlike the fathers' group they made a number of comparisons with school food on offer outside KSA.

6.3.1 Problems with the current school food system

The female participants expressed wholly negative views about the food currently on sale in school canteens. Their general attitude was summed up by the following exchange between the interviewer and the group:

> ***Q: So has anyone of you mothers ever complained about the food that is sold by the school canteen? What would you do if you weren't happy about the food on sale there?***
>
> ***P4F:*** *Well, I don't think* ***any*** [EMPHASISES WORD] *of us mothers are happy, are we? [LAUGHS AND LOOKS AROUND PARTICIPANTS IN THE GROUP]*
>
> *ALL SMILE BACK AND SHAKE HEADS IN AGREEMENT.*
>
> *P1F: No, no…* [OVERLAPS]
>
> *P2F: Not at all…* [OVERLAPS]
>
> P3F: *Not me!*
>
> P5F: *Me neither!* [THEY ALL LAUGH IN UNISON]

General descriptions such as "*bad*" [P2F], *"unhealthy"* [P2F, P3F], and "*harmful to the health of our children*" [P3F] were used to refer to what they thought about the food that was currently on offer. One mother described the school canteen as "a health disaster zone" [P3F] on the basis not only of the apparent lack of concern shown by the school about the quality of the food that was on offer but also about the school's failure to supervise what pupils were buying and consuming.

Mothers in the group also commented on the low level of nutritional value provided by the food in general "*It's got no value*" [PF1] and also identified what they thought of its major shortcomings, describing it as "*full of every kind of preservatives*" [P1F], "*sugary*" [P4F, P5F] and "*packed with sugar*" [P4F]. The poor quality was also emphasised, with one mother complaining about school canteens "*providing cheaper types of juice, not paying attention to the quality of the ingredients used in the sandwiches*" [P3F]. One mother's comment seemed to summarise general opinions about what was on offer: "*The stuff they sell children in school canteens here in Saudi Arabia, that's not food, it's not real food – it's… it's 'junk food'* [USES ENGLISH EXPRESSION]" [P1F].

These negative opinions about existing school canteen provision can be contrasted with how participants described the kind of provision they thought should be on offer:

> *Healthier […] something that that has health benefits* [P1F]
>
> *Something healthy* [P4
>
> *Fed in a healthy way* [P3F]
>
> *Good food* [P2]

Analysis suggests that some mothers perceived a difference between what was available for children to eat at the school canteen (often referring to this as "*snacks*" [P5 or "*sweet treats*" [P4F]) and what they referred to as "*real meals*" and "*proper*" food or breakfast as seen in the following extracts:

> *'Meals' is the wrong word! They don't get **real** meals, not **proper** food* [EMPHASISES THESE WORDS], *that's the problem.* [P5F]:
>
> I think that maybe they should try to serve a proper breakfast at school. [P4F]

Another mother contrasted the benefits of food that was "*home-made […] good traditional Saudi food*" [P1F] with the food that was typically available in school canteens which she described as:

> *The same cheese sandwiches day after day, probably from the cafeteria owned by the school principal's cousin, and all the problems with mouldy fateera tasbeerah from those bakeries that really just deserve to be closed down.* [P1F][26]

She made her own preference very clear: "*Home-made must be better than cellophane-wrapped Lusine!"* [P1F], referring to a popular brand of pastries typically available in the school canteens.

This participant was the only one to indicate the issue of the lack of variety in what is available for the children to buy with her comment: "*the same cheese sandwiches day after day*" [P1F] but it is noticeable that a very limited range of products were mentioned by the mothers, namely, chocolate [P2F, P3F, P1F], sweets [P2F, P4F, P3F], biscuits [P4F, P3F, P2F], *fateera tasbeerah* [P2F,

[26] An article in *Arab News* (28 July 2016) entitled "As temperatures soar, food poisoning risks rise" (http://www.arabnews.com/node/960891/saudi-arabia) informed readers about the launch of a new mobile phone app by the General Directorate of Environmental Health in Riyadh. It noted that since the start of 2016 this body had dealt with 4,480 reports of rotten foodstuffs, 291 incidents of food poisoning and 283 violations of Food Safety and Hygiene regulations in bakeries in the municipality of Riyadh alone.

P1F], sandwiches [P3F, P1F] with one mention each for juice and crisps [P1F]. It is difficult to know if this does indeed represent the limited variety of products on offer or whether this is all that the mothers' are aware of. However, this does seem to correspond with what I saw offered for sale during my visits to Medina girls' schools to conduct interviews. If this is representative, it suggests that schools are not following the Ministry guidelines on foods that can be sold in school canteens.

In addition, mothers made direct links between the type of food that was being sold to their children in the school canteen and broader health concerns currently prevalent within KSA:

> *I think they* [foods sold in the school canteen] *are responsible for causing all sorts of health problems* [P2F]
>
> *Is it any wonder that they make our kids unhealthy? That they're causing damage to their teeth, and increasing levels of obesity…* [P1F]

Mothers were particularly concerned about the effects of sugar on their children's dental health and linked this to their diet:

> *Two of my daughters have already had treatment for tooth decay and I'm convinced it's the amount of sweet things they eat.* [P4F]
>
> *Oh, don't talk to me about tooth problems. Tooth decay caused by sugary sweets…* [P5F][27]

Unlike the fathers' group, participants in the mothers' group not only commented negatively on the nature of the food that was sold at school but also expressed a number of negative opinions that were directed specifically at the canteen premises themselves where the food is prepared and sold. These comments were not related to the nutritional value of the food but highlighted their concerns about the standards of food safety and hygiene:

> *They're bad, they're unhygienic…* [P2F]
>
> *They were selling cellophane-wrapped <u>fateera tasbeerah</u> full of mould in a school canteen.* [P2]

It was unclear whether these opinions were based on personal first-hand experience of these problems or whether they represented general fears. It is also possible that they had perhaps been influenced by what participants had heard from other sources, in particular social media. One mother noted that

[27] Childhood dental caries is currently viewed as a serious problem throughout the Kingdom (Togoo et al., 2012).

[P4F] “there’s always *parents posting stories about food poisoning of children from food they bought in school canteens”.*

This also links to another theme that emerged from this focus group: the role that media (and particularly social media) play in raising levels of awareness about nutrition and food safety in KSA and more is said about this shortly (see section 6.3.5).

In general, the mothers were very negative about many aspects of the current school food system with one participant expressing the opinion that:

> *Even the worst countries in the world must have better school canteens than the school canteens in Saudi state schools…* [P4F]

Whilst this was clearly an exaggeration it reflected the depth of feeling amongst the participants in the mothers’ group. Although as a group they had different opinions on how best to tackle the inadequacies of the existing system of school canteens (section 6.3.7) none of them felt that the current situation was acceptable in terms of the impact this was having on the long-term health not only of their own sons and daughters but more generally on Saudi youth:

> *I think it’s really simple. What a child eats now will affect its health in adulthood. A child's diet affects its health forever so parents, school teachers, school principals and yes… our ministers even at the very top level should all be concerned about this issue. It concerns us all.*

It is worth noting also that whereas the fathers’ group were very concerned about the financial aspect of school food provision, and particularly about what happened to the profits from sales of food, the participants in the mothers’ group did not really discuss cost as a major issue with the current system. Only one participant stressed the importance of thinking about cost on the grounds that school food was “*too expensive for some families*” [P5F]. Instead when mentioning cost, the mothers tended to place an emphasis on the need for schools to provide quality and healthy choices rather than choosing food simply on the grounds that it was the cheapest option available. Only one participant openly voiced the opinion that the school might have an economic interest in the provision of school food:

> *Everyone knows that from the school point of view the most important thing is what’s in the student's pocket. They don’t care about feeding them good food* [P2F].

Another participant also hinted at possibly unfair practices, referring to the possibly of providers being awarded contracts on the basis of family connections [P1F].

6.3.2 Responsibility for control, inspection and monitoring

Outside the immediate concerns about the nature of the school food and premises where it is served, mothers raised another issue concerning the apparent lack of controls within the current system, at a number of levels. Three participants [P5F, P2F, P3F] specifically mentioned that found it worrying that there were no teachers involved in monitoring what children were buying and thought that the teachers should take at least some responsibility for what children, particularly the youngest pupils, consumed whilst they were at school. They argued that this was necessary on the grounds that children could not be expected at that age to make sensible nutritional choices:

> *How can six-year olds know what is good to eat? If no one helps them to make good choices, they will eat only what they like and know and that's biscuits, sweets, chocolate…* [P2F]

This idea was echoed by two other mothers:

> *Children are just left to make their own unhealthy choices and there's no real control over them.* [P3F]
>
> *How can I check what they buy? Who controls that? I find the sweet wrappers in their school bags so I know they are buying sweets at school…* [P5F]

The same participant [PF5] also raised broader concerns about responsibility for control, inspection and monitoring with the school food system as a whole:

> *There's no control – no control from the school at all. No teachers are there to watch children buying their snacks at the shop. And that makes me wonder whether... whether… I mean… is there anyone actually monitoring what is sold by the shop? Does anyone inspect school canteens?* [P5F]

This idea about where responsibility should lie for various aspects of the school food system emerged as an important element in the mothers' focus group. Firstly, there seemed to be a basic lack of knowledge in some cases about the type of controls that existed at the various levels (within the school itself and beyond school level e.g. at ministerial level). Secondly, there was also an underlying lack of confidence in whether these control mechanisms and

processes could be trusted to do what they were intended to do. Sometimes this feeling was expressed in half-finished statements suggesting the speaker was not very sure about the situation, for example, responding to P5F's concerns about the school canteen inspection process, another participant responded:

> *Well, I guess… I mean … surely the Ministry must…* [APPEARS TO BE THINKING THIS OVER AS THOUGH UNSURE] [P3F]

Both P2F and P5F expressed more open doubts about the effectiveness of the system, referring to an image of a mouldy pastry that had been posted by a parent on social media:

> P2F: *Disgusting, shocking… And that's what happening right now at a school in Riyadh, a school in the capital city of our Kingdom itself... May God preserve us!*
>
> P5: *Yes, that's what happening in the capital itself, mind you, not in some little out-of-the-way village somewhere. So where is the monitoring, I ask you? Where was the inspector?*

The implication is clear in this exchange. If the inspection process does not appear to be working in the very city where the Ministries of Education and of Health are based, both these participants feared that the process probably did not work at all.

At times, mothers were clearly frustrated by the apparent lack of concern shown about the effects of school food but had no idea how to go about improving this:

> *In the canteen they sell all kinds of things that are harmful to the health of our children […] Everyone knows it's so unhealthy so how long can canteens be allowed to carry on doing that? Why doesn't somebody do something to stop them?* [P3F]

6.3.3 The importance of breakfast

As was previously the case with opinions expressed by the fathers' group, mothers admitted that there was a gap between what they visualised as the ideal situation regarding breakfast and the reality of their own daily family routine:

> *I've read so many times in women's magazines and on health websites that breakfast is absolutely crucial for young schoolchildren and I know that ideally this should be served at home before school…* [SHE HESITATES] *but it's such a rush to get the whole family ready.* [P5F]

Lack of time was also identified as a reason for not preparing breakfast on schooldays by two other participants:

> *It's not really part of our routine as family. At the weekend it's different but on schooldays there's no time for making breakfast.* [P2F].
>
> *Yes- same for me.* [P5 F]

P5F raised another issue that had also been mentioned previously by the fathers: the fact that due to the earliness of the start of the school day, it is very difficult to get children to eat anything substantial:

> *[S]omeone tell me how do you get your kids to eat first thing in the morning when they're still half asleep? Does anyone know the secret of how to get kids to eat so early in the morning?* [SHE LOOKS ROUND GROUP] *A little chocolate-flavoured milk or orange juice, maybe a banana- that's about the most they can handle. Actually, me too* [SHE HESITATES] *I'm still a big fan of Nesquik!* [LAUGHTER] [P1F]
>
> *Yes. My daughter's just the same- we can't get her to eat anything. We've tried everything.* [P3F]

The mothers' answers suggested that none of the five participants regularly prepared breakfast on schooldays, emphasising once again the fact that for many Saudi primary school children the snack they buy from the school canteen is their first meal of the day. One participant made this link explicitly and highlighted the inadequacy of the current provision in this respect:

> *Children need more than a chocolate biscuit at school break, because that's meant to be breakfast for them.* [P4F]

One of the mothers also mentioned one of the problems with current system identified by the fathers in relation to the queues that build up outside the canteen and the impact that this has:

> *Because there are just too many children all crowding together at the same window sometimes she* [HER DAUGHTER] *doesn't get to eat anything at all. I've seen it at her school - there's only one little window where they sell everything. So, all the girls are crowding round the window together, all trying to buy something from the school canteen. I guess most of them are hungry by break-time just like my daughter. That really can't be good…* [P3F]

One of the mothers thought that the solution might be *"to serve a proper breakfast at school"* [P4F] and made a reference to 'Breakfast Club', using this English phrase, an idea she had come across whilst living in the UK. Although her own children had not attended their school's Breakfast Club and she did not

have first-hand experience of exactly what this consisted of, the name and the concept it represented had clearly remained with her. This was not the only comparison made with systems elsewhere.

6.3.4 Comparisons with provision elsewhere

Interestingly, the mothers' group made a number of direct and indirect comparisons with the kind of provision of school food that was available outside KSA. It emerged in the course of the focus group that one of the participants [P4F] had lived in the UK for five years with her family while she and her husband were studying there. At the time when the focus group took place (2015), another participant [P5F] had a cousin studying at a university in the United States. This had given both these women some insights into what was available elsewhere outside the Saudi school food system. As a result of the King Abdullah Scholarship Programme (KASP) established in 2005, hundreds of thousands of Saudis have studied abroad, with the UK and North America being the most popular destinations, so it is perhaps not surprising that the women were aware of what was on offer elsewhere. This also helps to explain why these comparisons were not with neighbouring countries but largely with developed countries:

> [P5F]: *She* [her cousin] *sent me photos. Look* [SEARCHES PHONE AND SHOWS IMAGES TO GROUP] *They have a buffet bar inside the school canteen and there's all kinds of things on offer there. Healthy things like fruit juice and milk but they serve them as smoothies and milkshakes so children will want to try them.* […] *I think we should get the Minister of Education and Minister of Health to visit schools in America and let them see the buffet system, refrigerated serve-over counters* [OVERLAPS]
>
> [P2F]: *Oh yes… they keep everything chilled and food looks so fresh.*
>
> [P5F]: *Exactly. Fresh food and lots of healthy choices.*
>
> [P4F]: *And no mouldy pastries!*

Although America is not noted for serving healthy school food, participants were clearly impressed by such aspects as healthy options, choice for children, the thought given to making the food child-friendly (*smoothies and milkshakes so children will want to try them)* and particularly the freshness. Given the often limited facilities and equipment in Saudi school canteens, their admiration for the refrigerated serve-over counters is understandable.

6.3.5 Mothers and media

Participants made several mentions of different forms of media including social media that suggested that this is an important means of raising awareness about issues relating to health more generally and particularly concerning nutrition and food hygiene. Sometimes participants spoke about media in general, referring to problems about school canteens being "*in the news all the time*" [P2F]. The same participant mentioned "*so many awful awful photos posted on social media*" [P2F] suggesting that sharing evidence of such incidents is commonplace.

Another participant [P5F] in the group was aware of the same incident in Riyadh that P2F was referring to, having also seen this on social media. P4F mentioned digital media as a source of information both about food hygiene and also as a means of learning about government plans:

> *I saw something the other day on You-Tube from a TV programme about the kinds of parasites school kids can pick up from poor food hygiene… [SHUDDERS] It was horrible, so frightening…* [P4F]
>
> *There's always parents posting stories about food poisoning of children from food they bought in school canteens.*[P4F]
>
> *I read stories in the papers online about Ministry plans to improve things* [P4F]

One participant made a direct link between media and nutritional advice explaining how she had made attempts to introduce fresh fruit into her children's school food as a result of reading "*those articles in the women's magazines about how to fool your kids into eating healthy*" [P1F].

One of the mothers also made a very revealing comment about use of social media as an informal forum for airing concerns about school food that cannot be raised elsewhere. When participants were asked if any of them had ever complained about the provision of school food, one of the mothers commented:

> *I don't think that complaining to the school would achieve anything. I think that's why so many parents post their comments online. It's a great way of getting rid of frustration!* [P3F]

Her comment was greeted by laughs, smiles and nods of agreement from other participants in the group.

6.3.6 Peer pressure

As with the fathers' group, there is evidence that even at primary school children are subject to peer pressure when it comes to the food they choose to eat at school. P1F recounts her attempts to supplement her children's diet with fruit from home:

> P1F: […] *children want to eat what their friends eat. Just try getting them to take something in from home to eat at school and see what happens. I fixed some fruit snacks for all three of my kids […]: washed some grapes and put some slices of peeled kiwi in individual little plastic containers, one each [...] Well, my youngest daughter told me she would have to share the fruit with her friends. My other daughter said: "I can't eat fruit at school, mummy! There's no time to wash my hands at break-time and it will make my books all sticky". And my son* […] [LOOK OF DISMAY]
>
> P5F: *Oh, wait, don't tell me. I know. Did he say: "fruit is for girls!"? That's what my son would say.*
>
> P1F: [LOOKS SURPRISED] *Exactly that, exactly. I tried to persuade him it was good for him, that it would make him big and strong and give him lots of energy but… impossible. […] I asked my husband to talk to him and what did he say? "Yes- our son is right. Boys don't take fruit to school. That's for girls only. All the other boys at school will laugh at him and say that he's a mummy's boy. Is that what you want?" I just gave up trying.*

As previously highlighted by some of the participants in the fathers' group, children do not want to be seen as different from their classmates and anything that marks them out in this way is not welcomed. This example also highlights the gender stereotyping that can apply in terms of food consumption and the potential impact that this can have on children's eating habits at school. Although this boy is still at primary school he has already picked up some clear messages from his peers about the kinds of food boys should eat, messages that appear to be reinforced by his father who is clearly concerned about the possibility that his son may face bullying for being different. Given that the Saudi educational system is gender-segregated throughout, this may indicate a need for taking different approaches to education about nutrition even with the very youngest children.

6.3.7 Possible solutions

The mothers' group proposed a number of areas that needed attention in order to start addressing what they saw very much as being a crisis not only in the current school food system in KSA but part of the broader health crisis facing the Kingdom. Three of the participants thought that this issue needed concerted effort in different areas by the government and its ministries, in other words, at a level above that of the school itself. P4F thought that the responsibility for improving the quality of school food specifically and more generally for "*keeping kids healthy*" lay with the government and argued that they "*should be putting more money into [this] now as it would save the state a lot of money in the future* [P4F]. The same participant stressed the need for providing good quality food, accepting that the government might need to outsource this but would need ensure the contracted canteen food companies were able to "*guarantee agreed minimum standards of quality*" [P4F]. Another participant was more specific about the strategy that was required at government level.

> *In my opinion, there should be more cooperation between the Ministry of Education and the Ministry of Health. They need to form committees and develop guidelines and monitoring to ensure that anyone catering for students must feed them in a healthy and well-planned manner.* [P1F]

Two participants indicated that the issue of healthy eating also needed to be addressed as part of the school curriculum [P4F, P3F]. One of these [P3F] also thought that schools needed to "*do something about physical activity*" although she did not specify whether she was referring to practical classes at school or simply addressing the importance of this generally within health education. She very much saw raising awareness about diet and exercise as a joint venture involving both home and school:

> *It's also important that the family alone shouldn't be responsible for what their child eats and their physical activity.* [P3F]

One parent wanted school to take a more integrated approach to how they dealt with health issues. She gave an example of how good practice in one area is undermined by what happens in another:

> *The school* [my daughters] *attend runs a 'Brush your teeth' campaign and someone comes in and gives them all a new toothbrush and the teachers do lots of activities about looking after your teeth* […] *but then everything they sell at the school canteen is still packed with sugar! How can that be possible? It makes no sense.* [P4F]

One of the mothers made a very interesting suggestion about how the current system could be improved and made healthier:

> *I think it would be a great idea if the Productive Families Project was allowed to supply their home-made food to school canteens and was paid by the Ministry of Education. That would help lots of Saudi women and their families and also mean good traditional Saudi food going into schools.* [P1F].

Under this government initiative, families, particularly women, were originally encouraged to produce traditional handcrafted goods and artisan foodstuffs in the home and then sell them in the local area. The scheme (which is also run in neighbouring Gulf States) has quickly become popular and the Saudi government and regional administrations now sponsor and run special fairs and trading events to showcase goods produced by Productive Families. In addition, producers themselves are increasingly advertising what they have for sale on their own websites or setting up pages on Facebook or using other social media to advertise what they have on offer and gaining customers outside their own immediate locality. Many women who work outside the home in the cities and want to serve traditional food for guests on special occasions such as Ramadan or Eid will order home-made dishes from a local Productive Family and have these delivered to the house.

The government has already attempted to address some of the concerns about health and hygiene standards raised here by some of the mothers by requiring anyone producing food products to attend a certificated course and to purchase a license.

This suggestion has many positive features since it would tie in with existing government initiatives to provide employment for Saudi citizens (particularly women) and thus serves a social purpose. It also emphasises the provision of locally produced food that is traditional (rather than the modern more Westernized diet).

6.4 Thematic analysis of interviews with head teachers

Two interviews were conducted with head teachers from two primary schools in Medina, one for girls, the other for boys and these proved to be a useful source of factual information about school canteens and the type of provision on offer. Both these interviewees were able to offer particularly interesting perspectives

on school meal provision. The male head teacher had also previously acted as a school canteen inspector himself. Parts of his interview were also used for the purpose of comparison with the interviews by individuals currently working in this position. The female head teacher was responsible for a school that had opted into a special programme devised by the Ministry of Education known as the Health-Promoting Schools scheme.[28] Schools that opt into this programme are expected to sell food that has to be healthier than the food that is usually sold in school canteens. In addition, in a Health-Promoting School:

> All members of staff work together to provide students with integrated and positive experiences and structures which promote and protect their health. This includes the formal and the informal curriculums in health, the provision of a safe and healthy school environment, the provision of appropriate health services and the involvement of the family and the community in efforts to promote health (Al-Shehri: n.d.).

It should also be noted that neither of the head teachers interviewed had any specialist training in nutrition or health-related areas.

6.4.1 Issues relating to the food served at schools

Even though the girls' school is part of the Health-Promoting Schools scheme, the head teacher's [HTF] description of the food that is served on a regular basis at the canteen suggests that much of this would not normally be classed as particularly nutritious. She refers to savoury pastries with a cream cheese filling, croissants, mini-pizza, cheese 'sandwiches',[29] and biscuits. HTF stresses that the food they serve is "healthier than the usual school canteen food" and "*healthier […] than the children would get at other schools*" [HTF] and there are some indications that attempts are made to provide more nutritional products as they sell sweetcorn, fruit and fresh fruit salads, stuffed vine leaves[30] in tins, and popcorn [HTF].

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[28] This educational initiative complements the school health initiative of the World Health Organization that is intended to mobilise and strengthen the promotion of school health and educational activities at local, national, regional and global levels. The idea is that students are able to transfer the skills and knowledge they gain from school to their families and beyond into their communities. For more information, see Al-Shehri (n.d).

[29] The 'sandwiches' that HTF refers to here are not like the sandwiches typically sold in the UK. These are a product commercially produced in bakeries, consisting of a brioche-type dough roll with a sweet or savoury filling.

[30] These are known as *waraq aynab* in Arabic and are a regional speciality in the Gulf States.

The difference in these foods and those typically on offer is confirmed by the head teacher at the boys' school [HTM] who as a former school canteen inspector had a good idea of the food on sale in schools elsewhere in Medina and surrounding districts which he described as consisting of "*sweet and savoury pastries made at a local bakery*" [HTM] or being pre-packaged food or drinks (milk, fruit juice, water).

HTM also highlighted some of the problems he had found with food on sale in other schools in his role as canteen inspector, mentioning crisps with a high salt and fat content and products containing harmful artificial colouring including ice lollies and fruit juices "*to make them look more appealing for children*".[HTM] The element of visual attraction in colours and packaging was also raised by the two parent groups previously and possibly suggests that the visual appeal of food and drinks very much influences the choices they make.

Another element that emerged indirectly from the discussions with the head teachers is the lack of variety in the provision that is offered to the children. This echoes a point that also emerged as an implicit theme in the parents' groups when analysing the food stuffs that they mentioned as being on sale in the school canteen. Interestingly only one of the adults interviewed raised this explicitly as an issue. According to the HTF, the food that is brought in daily from the canteen supplier "*is always the same*" [HTF] and is likely to consist on a daily basis of a limited choice or no choice from the items on offer: as noted previously, savoury pastries, croissant, cheese 'sandwiches' or mini pizza. HTM confirmed that this selection is typical of what would be on offer from the local bakery, which would usually be the business contracted to supply a school.

When asked about this lack of variety, HTF explained that other items, some fresh, some pre-packed were sometimes available as well but added "*The main thing that I'm personally concerned about is that the food delivered from the local bakery has to be freshly made every day*". Clearly, food safety concerns were the key priority for her in her role as head teacher. This is understandable given the frequent reports of food poisoning incidents at Saudi schools that appear in the press and then are often re-circulated on social media.

This limited and repetitive menu does little to encourage children to experiment with a broader range of foods, and may be creating problems in the future, making it more difficult to persuade them to take up a more varied and healthier

diet. The fact that this issue merited little discussion by parents or head teachers may suggest a lack of awareness or possibly that they themselves eat a fairly limited range of foodstuffs (see 7.8.3).

6.4.2 Food links with the local community

Both HTF and HTM referred to the key role played by the local bakery, highlighting that in Medina school canteens still maintain links with the local community. The bakeries that HTF and HTM referred to are still likely to be family-run concerns and may have long-standing agreements with schools. This is quite different to the typical situation in the UK where school meal provision is now often supplied by large national or even multi-national companies who will have gone through a competitive tendering process to win contracts.[31] In some other parts of KSA, however, school canteens are now supplied by government-appointed companies and they provide the same commercially produced and pre-packaged products to all the schools within a particular metropolitan area, such as Riyadh.[32]

The dependence on locally based companies has both negative and positive aspects. Using a locally based family-run business may lead to contracts being awarded on the basis of kinship ties (which are still very strong in KSA) or friendship and is open to financial abuse. However, knowing the provenance of the products to be consumed by the pupils can be reassuring for head teachers and parents. HTF stressed the freshness of such products, possibly because there has been so much negative publicity about mouldy pre-packaged mass-produced items sold in school canteens, as noted by the parents.

Given that the bakery is local and presumably situated not too far from the school, one of the comments made by HTF may initially appear puzzling. She noted that "*Sometimes the delivery from the bakery can arrive late*" [HTF] and talked about the difficulties that this may entail for the timing of breaks.

[31] The multinational contract catering companies Brakes, for example, operates in three EU countries in addition to the UK where they supply to "over 9,000 sites including primary, secondary and over 250 higher education establishments" (https://www.brake.co.uk/your-business/your-sector/education).

[32] According to its website (https://www.gulfcatering.com/services/schoolfeeding), the Gulf Catering Co. provides pre-packaged breakfast meals to more than 1.2 million students in 2,700 schools in Riyadh, Jeddah and Dammam, delivering these in its own fleet of refrigerated lorries A report on a visit by journalists to the company's production plant in Jeddah in 2006 noted that the company produced 45 items for school students, listing these as "sandwiches, pastries, pizza, doughnuts, croissants" (Akeel, 2006).

However, this is, in fact, an indication of the levels of traffic congestion that faces Medina and all large Saudi cities. A very large percentage of the Saudi urban population travel in their own cars or by taxi even if quite short distances are involved, mainly because public transport is not viewed as an option for various reasons.[33] This also illustrates some of the difficulties facing parents trying to ensure that all their children reach school on time when they may be based in up to four separate locations depending on their age and gender.

6.4.3 Snack or breakfast?

The nutritional importance for the children of the snack which they obtain from the school canteen was once again highlighted by a comment from HTF:

> *I suspect hardly any of the students has breakfast before arriving at school. Virtually all of them eat their breakfast at school. They wake up too late to have time for breakfast or they don't feel like eating — from what the children tell me, most of their parents don't eat breakfast either! [HTF]*

This confirms the earlier impression gained from the parents' groups that for a number of reasons, usually lack of time (often a result of the travel difficulties noted above) or lack of appetite, during the school week at least families rarely sit down to eat breakfast together. Thus, for many children, the first food of the day they eat will be the snack they purchase from the school canteen. This was also reflected in the questionnaire results. This is further evidence of the need to appreciate the major role that school canteen snack food plays in the diet of Saudi primary school children.

6.4.4 Lack of space and facilities

HTM echoed the concerns cited by parents, particularly those of boys, about the difficulties faced by children trying to access the school canteen and purchase food. As a former school canteen inspector, he had a good overview of the range of difficulties faced by schools operating within the current system. He noted that primary schools can vary considerably in size, from just 400 pupils to 900, depending on the area that the school is situated in. Consequently, in some schools, numbers can be as high as "*42 or 45 students in a class*" [HTM].

[33] These include cheap petrol prices, lack of government investment in public transport and Saudi sociocultural traditions relating to gender and privacy. See M. Aldalbahi and G. Walker (2016) Riyadh Transportation History and Developing Vision, *Procedia-Social and Behavioural Sciences,* 216: 163-171.

If the numbers expand in a school, "*canteen facilities can quickly become overused*" [HTM].

When large numbers of students all come out of classrooms together at break times, the resulting overcrowding leads to fights breaking out in the queues. These problems are made worse by the fact that typically in KSA teachers do not usually take any part in monitoring students during break times and "*food handlers aren't able to cope with those kinds of problems*" [HTM]. As a result, "*things can really get out of hand*" [HTM] and "*the level of service is often bad*" [HTM].

HTF was also aware of these problems, but acknowledged that actual fighting was relatively rare amongst the girls. However, her school had put a number of measures in place designed to address the difficulties that had previously been experienced with the school canteen facilities:

> *Our system here is to have two breaks- we have one lasting 35 minutes at 8.20 which is when the girls eat. Then there is a second break lasting 20 minutes at 1100 but that's used mainly for play although the school canteen is open for the sales of small snacks. We have also allocated different areas that can be used for eating as a means of solving the problem of overcrowding caused by pupils remaining close to the school canteen to eat what they have bought.[…] Something else we do is to have staff on duty to monitor the students and prevent overcrowding and make sure everyone queues up.[HTF]*

As HTF notes "*It's quite an unusual system here* [i.e. in KSA] *and we're quite proud of it because we think it works really well".* HTF did not explain how long the system had been in operation or what prompted these changes in the first place but it does appear to address the major concerns that were voiced previously by parents. HTF also did not comment on whether the involvement of teachers in monitoring break times was voluntary or obligatory and what teachers' reactions to this change had been.

Like many Arab countries, the population of KSA is continuing to grow. It attracts a great deal of immigration from other countries in the region and beyond and this is continuing to put pressure on the school system in terms of space, particularly in the urban areas. Unlike UK schools that often have a space designated for eating and have large multi-purpose indoor areas such as assembly halls, or playgrounds that can be used for break-out space for pupils and activities, it is relatively rare to find this type of facility in Saudi state

schools.[34] Since education still tends to be more formal there, even at primary level, it is common to just find classrooms with rows of desks and chairs. HTF explained that in her school, there was no outdoor space or school patio which meant girls had to remain inside at break time.[35] However children were free to eat anywhere they wished inside, and chairs and tables were provided.

It could be argued that the lack of designated space for eating may encourage a snacking mentality amongst the children, so that they see it as normal to 'grab and go' instead of seeing the eating of food as a pleasurable social activity to be shared with others. It may also discourage children from bringing in home-produced food as this may simply be viewed as too troublesome when compared to the snack food available from the school canteen.[36]

The lack of space mentioned here also raises the issue of physical exercise and the curriculum for girls in KSA. As discussed elsewhere (see section 3.6.1) the subject of physical exercise has been the focus of a significant ongoing debate in recent years and there has been major criticism of the Saudi Ministry of Education's policy on this issue, from both inside and outside the Kingdom, from many different organisations and a range of perspectives. Here it is worth noting simply that the lack of physical spaces in schools, highlighted by HTF's comments, suggests that a great deal of thought would need to be given to be given to the practicalities of how the decision to change this aspect of the curriculum for girls will, in fact, be enacted.

6.4.5 Provision for students with special dietary requirements

A theme that had not previously been raised in any detail by parents in the focus groups emerged in interviews with both the head teachers and highlights another key problem with current school canteen provision in KSA. When asked about how the school deals with students who have special dietary requirements, HTF's response made it clear that currently, no special provision is made within her school for pupils with an existing condition, such as diabetes, that would require close monitoring of food intake:

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[34] See Omari (2011) for descriptions of typical school design in KSA and how this impacts on students.

[35] Khafaji (1987) notes that the architecture of girls' schools in KSA is often influenced by Saudi traditions regarding gender segregation and privacy.

[36] See various articles by Janet E. Dyment on 'green school grounds' in *Children's Geographies* journal.

> *We only serve one set of standard meals; the same food for everyone. The students themselves have to take responsibility for any food problems they have – if something has too much sugar in it, we think that it's the student's own responsibility to think about that. We don't have any particular regulations about dealing with diabetic students at school. It's the same for girls with asthma- there is no information about any special diets for students who have asthma.* [HTF]

When asked for clarification of this point, HTF again stressed "*We offer the same food for everyone*" [HTF] and made it clear that although a school health supervisor ensured appropriate arrangements were in place for any student needing to take insulin, that was the limit of the school's responsibilities in this area.

This apparent lack of concern about an issue with potentially major health implications or even life-threatening consequences in the case of something like a severe peanut allergy seems worrying but according to HTM, this was apparently an attitude that was prevalent regarding food provision in the education sector, both at school level and beyond:

> *That's the kind of school canteen issue that the Ministry of Education doesn't seem to care about or take action on. No one seems to care about the bigger picture- neither the schools nor the government shows any real signs of concern about children with diabetes or obesity or children that suffer from food allergies*. [HTM]

This attitude is particularly worrying given that, as noted previously, diabetes is currently on the rise in KSA. In addition, although few studies have been done on the topic of food allergies in KSA (as is the case for many developing countries), there is growing evidence that prevalence and incidence rates are rising and that those with asthma and related conditions can be significantly more sensitive to peanuts, eggs and cow's milk.[37]

The current approach in the Saudi education system is clearly a very different approach from that which would be necessary in the UK where schools, like all other establishments serving food, are legally required to label all food stuffs containing potential allergens to alert students to this. School and local education authorities are also required to have a written allergy safety policy.

[37] See J. I. Boye (2012) Food allergies in developing and emerging economies: need for comprehensive data on prevalence rates, *Clinical and Translational Allergy* 2:25 DOI:10.1186/2045-7022-2-25. This gives details of papers published on Saudi research.

Moreover, schools that serve food increasingly provide alternatives for pupils requiring nut-free, milk-free or gluten-free meals (FoodsMatter.com).

6.4.6 Links between school food and the home environment

HTM had also noticed a phenomenon that was discussed by both mothers and fathers: children being ridiculed by their class mates for eating healthy food that they had brought in from home:

> *Other children laugh at them – that's because in so many families there's no culture of eating healthy food –there's no awareness about what kinds of food children should be eating to keep them healthy. That can be a particular problem for families coming from less developed countries outside Saudi Arabia. Those children are often not used to the snack food on offer at school; it's new and exciting for them and they think it's great to eat chocolate bars and crisps.* [HTM]

This highlights an issue that has been noted in many developing countries: the rejection of more traditional (and often healthier) diets in favour of Westernised pre-packaged snack foods that are perceived are being more modern and attractive. In addition, HTM commented on the difficulties of trying to change children's dietary habits by enforcing bans on the sale of unhealthy items in the school canteen. The Ministry of Education brought in regulations that prohibited school canteens from selling fizzy drinks such as Pepsi and hoped that this would make children buy water or milk form the school canteen. However:

> *Inspectors tended to find that the kids started bringing energy drinks from home, even ones that were really unsuitable for children of primary school age, such as Red Bull.*[HTM]

Although the Saudi government brought in a ban on advertising of energy drinks and limited distribution and sales in March 2014, the energy drinks markets is still growing in the Kingdom (Bouckley, 2014). According to a market analyst for the drinks sector in the Gulf States "because [Saudi] society is not very well informed about the health risks imposed by energy drinks, the youth population still has access to these products and are not likely to pay attention to such risks" (Bouckley, 2014). HTM's observation also suggests that some products brought in from the home environment for consumption at school are accepted and can even become desirable if they are branded products that carry positive connotations for pupils, and could be as unhealthy as items sold in the school canteen.

6.4.7 School canteens and finance

Given his previous role as a school canteen inspector, it was somewhat surprising to find that HTM was openly critical of the attitude of the Ministry of Education towards school canteens. In that role, he explained one of his duties was:

> *monitoring the financial aspects of the operation of the school canteen […] checking the records kept by the head teacher concerning how much income the school makes from its canteen and, determining, more importantly, what the profit margin is.* [HTM]

Based on his experience, however, he felt that this part of the role actually took precedence over the other functions of inspecting school canteen premises and ensuring that any food handlers employed by the school conformed with all the necessary legal requirements concerning food safety and hygiene:

> *As far as the Ministry is concerned, the cheque is the most important aspect of the school canteen. I don't think the Ministry really cares about the other aspects of the canteen. The Ministry responds immediately if the cheque isn't sent on time. It's much slower to respond to reports about problems in the school canteen.* [HTM]

He pointed out that the current financial system encouraged schools to attempt to maximise the profits that they were able to make from the school canteen since it represented a potentially significant source of funding for them that they controlled. However, this too often led to the situation in which "*all the school is concerned about is increasing their profit margins. That's all they're interested in*". [HTM]. He noted that a lot of the bad practice he had observed in schools was motivated by the fact that "*the head teacher is interested in making bigger profits, not selling quality food of the kind children really need*" [HTM].

This dilemma was illustrated in some of the responses given by HTF. When asked outright by the interviewer "*Would you ever put profits before the health of your students?*", HTF's response was immediate and clear-cut: "*Definitely not!".* However, her observations elsewhere in the interview suggested that this issue may not be as black and white as she claims. Even as the head of a school in the Health-Promoting Schools Scheme (see footnote 28), she is clearly aware that the school canteen represents a potential income stream and two of her remarks suggested that she knew of strategies that could be used to maximise that income:

> *If we opt for cheaper products to keep the purchase price low we can improve our profit margins.* [HTF]
>
> *I was going to have vending machines installed in the school but that was only for between classes- not for break time* [HTF]

She did not comment on any potentially negative effects of these strategies, such as lowering the quality of the products on sale.

Another of her responses clearly showed that she thought that there was room for compromise on certain issues to ensure that the school maintained a good business relationship with the school canteen supplier:

> *Yes, sometimes we've caught them* [the company] *bringing products in that are banned but we do need to be a little flexible because the company also needs to make some profits. The most important thing is to check that there are no lollipops, no sweets containing gelatine or artificial colours- they're absolutely banned. I also banned milk chocolate bars but sometimes we allow them to sell dark chocolate with a high cocoa content which is healthier. Children are allowed to have chips in some schools but not here. They're nothing but fat-soaked potatoes!*

Her answer suggests that the sale of some foodstuffs is non-negotiable. Although she does not explicitly state these grounds, these would seem to be that items cannot be sold if (1) they contain too much sugar (lollipops), (2) are not *halal* (sweets containing gelatine), (3) can cause negative effects on concentration (sweets containing artificial colours) or (4) contain too much fat (chips). However chocolate appears to be negotiable, although it is on the list of items that should not be sold in schools. Thus, she will not allow the company to supply milk chocolate bars but sometimes allows them to sell chocolate bars with a high cocoa content, justifying this decision on the grounds it is healthier.

This interview illustrates the difficulties and temptations that head teachers face running a successful school canteen face in the current Saudi system. They have to attempt to strike a balance between a series of often competing priorities: legislative, regulatory, financial, nutritional, and educational. Satisfying the needs and desires of one set of stakeholders may well mean disappointing the others.

While parents were forthcoming in the focus groups where interaction between group members put participants at their ease, head teachers were usually more guarded about providing their own personal opinions during interview and occasionally seemed to be quoting school or Ministry policies rather than

expressing a personal opinion. This is perhaps not surprising given the positions that they are in, since in one sense, speaking in their official capacity, they might be seen as representing the Ministry.

Another point that may be worth mentioning in this respect is that both these individuals were considerably older than the parents and teachers who participated in interviews and focus groups. This is typically the case for those occupying senior roles within the Saudi education sector. This meant they perhaps had less personal involvement in this topic since they no longer had children of primary school age and in that sense might have been more distanced emotionally from the issue. When reflecting later on the results from the various stakeholders who participated in this research, it may be relevant to consider this aspect of personal vs. professional interest in this issue given that some of the teachers interviewed were also be likely to have had primary-school age children themselves and so had the benefit of a double perspective on this topic.

6.5 Thematic analysis of interview with the Head of School Services

An interview was conducted with an official responsible for implementing central government policy in the Department of Education in Medina. His job role covered responsibility for overseeing the School Canteen Section and he occasionally still worked as a school canteen inspector. Like the two other interviewees with experience of inspecting school canteens, this Ministry Official [MO] did not have any specialist training in nutrition or health-related areas.

6.5.1 Issues relating to the food served at schools

MO explained that although school canteens offer more or less the same type of snacks for all schools, regardless of the level (primary or secondary), it is expected that both milk (usually flavoured) and dates will be on sale on a daily basis for primary school children:

> *It's an important point for a school canteen inspector to follow up. Schools must sell milk products. It's seen as a negative point for a school if it doesn't offer dairy products and dates.*

As previously noted (section 2.3), dates carry both a symbolic religious meaning for Saudis and have long been a stable of the Gulf States' diet. This is no doubt related to the fact that they are one of the few agricultural products that are well-

suited to the climate in the region and are produced in vast quantities. Cow's milk, however, is not a traditional element in the Saudi diet but is now heavily promoted by the Ministry of Health as a source of calcium for children. The Ministry official's comments may help to explain why cheese features so prominently in the food that is served on a regular basis at the canteen.

Not surprisingly, when asked about the food that should be offer, MO quoted almost word for word some of the policy document, stressing that "the fruit juice on sale must have a nectar percentage not less than 30%". It is unclear however on what grounds "*popcorn was forbidden but sweetcorn was allowed*" and "*the fateera mustn't contain fat*" since none of these items are specifically mentioned in current published guidelines.

6.5.2 The limitations of the current school canteen system

When asked what the function of canteen inspectors was, the MO defined this role as being to ensure "*that regulations are being followed and verify the quality of the food".* However, his responses make it clear that in his view, which appears to represent that of the Ministry, 'quality' refers purely to food that is fit for consumption as opposed to nutritionally sound food that might make a positive contribution to the health and well-being of primary school children.

The MO's descriptions of the duties of school canteen inspectors suggest moreover that they very much operate at the level of ensuring that basic food safety and hygiene routines are being followed:

> *When we inspect, we have health requirements about the canteen premises in terms of the location, space, and security and safety fixtures, such as a fire extinguisher and the right ventilation […] Part of our responsibility as inspectors is to help head teachers to choose the most suitable location for the canteen.*

Again, these are all items covered on the inspector's checklist, suggesting that he is citing these from memory.

In fact, throughout the interview, the MO firmly placed the emphasis on foodstuffs and school canteen practices that were not allowed under current regulations:

> *Fateera may be stuffed with cheese and vegetables but meat is forbidden as a filling because of the fear of food poisoning. […] It must*

also be within date and any schools that contravene these [school canteen] *regulations are held accountable.*

The school's relationship with the company providing the school canteen food is also conceived within a legal or regulatory framework:

> *Before the contractor leases the canteen he must sign a contract with the school director and is shown the list stipulating what is allowed, for example, the permitted fillings for fateera as well as the type of juices that are allowed, etc. When the contract is signed the contractor receives a copy of this list. Fines are imposed if the contractor sells anything that's not allowed under the regulations.*

When asked if schools ever broke the rules, he answered:

> *Rarely; if the head teacher shows the contractor the regulations and the school administration monitors this daily there won't be any infringements of regulations. If there are infringements because the contractor refuses to follow the regulations, the head teacher can end the contract.*

It is noticeable in these statements by the MO and throughout his interview that there was no indication of any attempt to address the possibility of encouraging good practice in school canteens or of developing nutritional guidelines that ought to be followed by schools or contractors. It is not surprising, then, that when he was asked if he was satisfied with the Saudi school canteen system and the food it provides, he answered without hesitation: "*I think the system is good",* having previously noted: *"Things are getting better; things have improved over the years. Previously, there were fizzy drinks and all kinds of crisps, but now, thank God, regulations apply at schools".*

The difficulties of this approach are reflected in the MO's apparent lack of concern that fruit and vegetables are not available at all schools since these are simply classified as "allowable" under current regulations and their availability is not obligatory.

These examples highlight the limitations of the current canteen system in Saudi state schools since it measures progress purely in terms of compliance with minimal standards rather than encouraging and monitoring the spread of good practice. It also points to the difficulties of using staff without appropriate qualifications in nutrition who find themselves having to operate purely on the basis of checklists rather than making informed decisions.

6.5.3 Food links with the local community

Prior to the interview with the MO, there had been a lot of coverage on Saudi media about the possibility of the Productive Families initiative becoming involved in the provision of food in school canteens on the basis of an ongoing pilot scheme that had been launched in Riyadh. This encouraged existing small family-based food enterprises to offer their services to schools.

Although the MO mentioned this initiative, he viewed this positively on the basis that it would "*certainly be a useful source of employment for workers who are Saudi nationals*" – in other words, he saw this in economic terms rather than thinking about how this might impact for better or worse on the nature of the food provided in school canteens. On one level, his comment is understandable, given that the Saudi government has been placing ever increasing emphasis on the need for Saudization of the workforce since the dramatic drop in worldwide oil prices has begun to significantly affect the Kingdom's economy. However, since the school canteen programme represents a major part of this MO's responsibilities, at least some consideration of this might have been expected. In fact, the only other concern that he voiced related to the additional workload that this was generating for the School Canteen Section:

> *Currently we have to check that each person involved has all the necessary health, hygiene and food safety certificates to work in this industry but if a separate entity could be responsible for everything related to this project it would be better.*

This comment points to two of the underlying reasons why bringing about change for the better within the school canteen system as a whole is likely to be a long and arduous process. The first relates to the bureaucratic nature of life in the Kingdom. When the Saudi government urged those involved in the Productive Families initiative to consider taking over provision of school canteen food, newspaper coverage noted that in addition to Saudi nationality and a large capital sum, these family-run enterprises also needed to obtain:

- Recommendation from the Ministry of Labour, Ministry of Social Development or another institution or committee active in the Productive Families field on the basis of previous good conduct, proven efficiency and product quality.

- Valid health certificates and licenses from the Ministry of Municipal and Rural Affairs, confirming the health safety of family members and completion of necessary training courses on health standards.
- Documentation demonstrating conformity to Ministry of Education school food quality and health safety requirements (*Saudi Gazette,* 2016).

Not surprisingly, many were deterred by this bureaucratic process. This also illustrates that at no stage of this process would any official body consider the nutritional quality of the food to be offered, and that effectively only the school itself would be in a position to assess and monitor this to any degree.

6.5.4 Snack or breakfast?

The MO confirmed the nutritional importance of the food that children purchase from the school canteen:

> *We are different from schools in some other countries because the school canteen snack actually represents breakfast for those students who didn't eat this at home, so we are careful to make sure this is a healthy meal.*

He also notes that the Ministry of Education has recognised the importance of this meal by allowing schools to shift the time of the first break at school from 9.30 to 8:20:

> *In the past, students ate their breakfast at home but now that the day for students starts earlier due to traffic congestion, that means some of them don't have breakfast because there just isn't enough time. That means children now eat their first meal at school and it was better to move the break forward.*

This reflects comments by participants in focus groups and other interviewees about changes in Saudi society.

6.5.5 Parental responsibilities and nutrition

One of the issues about which the MO did appear to state more personal opinions was the role of parents in relation to their children's eating habits. He claimed that as a MO, he received few complaints about school food-related issues and added that "*most are the results of a lack of parental knowledge or the contractor failing to follow the guidelines*". He went on to explain this point in more detail:

> *Students bring food and drink that isn't allowed into school and that's the fault of the parents' way of life. If a student brings something that's forbidden in, the school administration confiscates it and then provides him/her with breakfast but if a child is bringing in something that's against the regulations every day, what can be done? It's the responsibility of parents to know about healthy food.*

He later returned to this point, drawing on his experiences as a school inspector:

> *When I'm visiting a school if I see students sitting in the school patio eating crisps or other food they're not allowed to bring in from home then I ask the teacher with responsibility for health education about it. I'm often told "We take it from them and then give them a meal from school. But then when the student goes home, her family complain. Mothers come into school saying "School has no right to confiscate my daughter's food".*

In his opinion, "*students' families lack awareness about nutrition*" and his solution is "*a programme to teach the parents at school*". However, he then notes that schools already hold information meetings for parents but these tend to be badly attended and suggests this is due to what he calls parents' "*laziness*". Elsewhere he does acknowledge, however, that "*Some families are very careful about what their children eat*".

His observations here regarding the apparent lack of interest of many parents, what he refers to as their "*laziness*" and lack of knowledge about the subject of nutrition merit further discussion. None of the teachers or parents in the focus groups mentioned these school meetings and since all of them volunteered to take part in the project, this suggests they all have a fairly high degree of interest in the subject of school canteens and their children's nutrition. However, it was noticeable that many of these individuals relied on social media and internet sources for their information and perhaps they feel that this was a more convenient way of enhancing their knowledge about nutrition than attending school events, particularly given the limited time availability that many participants referred to. Other comments by participants did suggest that there was a genuine lack of knowledge amongst parents, particularly fathers, about certain aspects of what constituted a healthy diet for children (section 6.2.1), indicating that there may be many more parents with much more limited understanding of nutritional principles. Engaging those parents, particularly

those from other cultures, may represent a significant challenge for the Ministries of Education and of Health.

For the most part, like the head teachers, this interviewee was fairly guarded about expressing his own personal opinions during interview and, as might be expected, he was a useful source of more factual information about Ministry of Education policies, the school canteen system, the inspection process, implementation of regulations and the financial aspects of the system. However, he was more forthcoming about some issues that he appeared to feel more strongly about and that appeared to be based on his own experiences as a school canteen inspector.

As with the head teachers, he was considerably older than the parents and teachers who had taken part in interviews and focus groups, meaning that he was unlikely to have children of primary school age and had been in post for several years and so at the time of his interview it was unclear what his direct involvement in the day-to-day world of the school canteen system was.

6.6 Thematic analysis of interview with school canteen inspector

The interviewee [SCI] had spent 15 years as an inspector of school canteens and then went on to set up her own private primary school. She provided a lot of information about the financial aspects of the system and the various programmes that the Saudi government had introduced at different times, all of which contributed to Chapter Two.

6.6.1 School canteens and finance

SCI largely echoed the points made by HTM about the role of the school canteen inspector being to a large extent a financial one, with this role taking precedence over the other functions of inspecting school canteen premises and ensuring that any food handlers employed by the school conformed with all the necessary legal requirements concerning food safety and hygiene. She also thought that more recently things had changed for the worse since funding cuts were encouraging head teachers to maximise benefits from the school canteen by charging higher rents to tenants. This, in turn, was meaning that they were buying poorer quality food to sell to children in order to maintain their profit margins:

In reality,very few schools are interested in healthy food and now that schools are increasing the rents for the lease, to try and supplement lower levels of government funding, this will put even more pressure on tenants and will drive the quality down so that they can keep their profit margins.

6.6.2 Parental responsibilities and nutrition

The canteen inspector also pointed to the importance of the home environment in establishing eating habits:

> *Sometimes students won't try food they are unfamiliar with. Some children have a very limited diet at home, which is a result of their parents providing a very restricted diet for them at home. If parents are used to living off fast food then their children will be also and it's very difficult to break those habits.*

However unlike the MO she did not give any reasons for this behaviour by parents or attempt to link this to factors such as laziness or lack of knowledge.

6.7 Thematic analysis of teachers' focus groups

Although the groups were run separately, the results are combined here to give the teacher perspective. The group of female teachers ranged in experience from one to ten years of teaching [TF1, TF2, TF3 and TF4] while the male teachers varied from two to 13 years in the system [TM1, TM2, TM3 and TM4] and sometimes their answers clearly reflected the double perspective of teachers and parents. Many of the points they made reflected themes that had already been mentioned previously by parents or other interviewees, suggesting that data analysis was reaching the point where no new information was being introduced i.e. data saturation had been achieved (Fade and Swift, 2010).

6.7.1 Problems with the current school food system

Teachers identified many similar problems to the mothers' group in terms of the poor quality and nutritional value of the food:

> *TF3: I'm [PAUSES AND TRIES TO FIND THE RIGHT WORD] ashamed, yes- that's it. Ashamed that in our Kingdom we feed this awful stuff to our children. Because that's what it is –it's rubbish!*

> *TFI: Yes- that is the right word. Just look at what's on sale: what's on sale doesn't take the slightest into account what children need for good health.*

They also drew the same links between the type of food children were eating at the school canteen and broader health concerns currently prevalent within KSA

> TM2: *What's on sale doesn't take the slightest into account what children need for good health. We all know the problems this generation is facing. You only have to read the newspapers. Headlines every day about obesity, diabetes and just this morning, figures about primary school children with tooth decay…*
>
> *TM3: I swear that most of those kids have tooth decay from the sweets and biscuits they buy in the school canteen.*

They also felt that the funding mechanism for the school canteen was an important factor determining what got sold at the school canteen:

> *TF1: At the moment, the main aim of the school canteen system is making profits, the more profits, the better. We need to start putting the health of Saudi children before making riyals.*

6.7.2 Responsibility for control, inspection and monitoring

The teachers were very aware of the problems of overcrowding and one new teacher was shocked by the standard of the girls' behaviour:

> *TF2: We've even had some fighting outside the school canteen window… nothing really serious but just pushing and shoving that got out of hand because the break is so short and the students are worried they won't get served.*

The teachers generally agreed that this control of students and monitoring what they ate was a problem, but interestingly, none thought that teachers should have responsibility for these tasks and they did not make any suggestions for improving the situation:

> *TF2: Students can eat whatever they like; no one is controlling them. The canteen staff don't accept any responsibility for that. Kids can't concentrate when they don't eat well. It would actually make teachers' lives easier if the kids ate better.*
>
> *TM1: How could one or two teachers be expected to supervise 600 students from different school years during break time? It's impossible. And besides - we're not nutrition experts. If they want us to be responsible for that, we'd need to do courses.*

The discussion also revealed very different levels of knowledge about current school canteen regulations amongst the staff. At one extreme TF2 seemed

largely unaware of the existing regulations whilst TF4 claimed to be "a real expert" in her own words, thanks to a colleague who ensured that all staff were well informed about nutritional matters although this was not part of her job description:

> *TF4: I think it's all because we have a young teacher who studied nutrition in America. She went there with her husband and did a postgraduate course. She checks everything, every single thing [EMPHASISES EVERY WORD]. Too much sugar – not for sale. Artificial colouring – not for sale [MIMES THROWING SOMETHING AWAY]. She got the head teacher to agree to lots of changes… […]*

> *TF4: My colleague makes sure that all of the teachers are aware about this- gives us mini-lectures [SHE LAUGHS AND WAGS FINGER]. "We need more fruit salad in the school canteen. No more biscuits at break time, ladies!". [PAUSES AND FROWNS SLIGHTLY] Actually, sometimes it's too much. I need my chocolate biscuits after nearly two hours of classes! [THEY ALL LAUGH]*

On the one hand, this suggests the influence that a single knowledgeable and determined teacher can have on nutrition in the school environment. However, there is perhaps also a hint from the teacher's reaction that she may be viewed as somewhat overbearing and judgemental by her colleagues which may be counterproductive in getting across her healthy eating message.

6.7.3 The importance of breakfast

The teachers also commented on the importance of breakfast but it was noticeable that they concerned about the effects that this appeared to have on students:

> TM2: *Too many children have to take breakfast at school. Some come in without even having a mouthful; I'm convinced of it… that's not a good start to a day of lessons. It's really noticeable that they lack concentration, particularly in the first class of the day.*

The female teachers focused on what happened to students after eating snacks from the school canteen:

> *TF3: I always notice the difference after break time. The students are always more active […]*

> *TF1: I think some are too active, what's the term now –hyperactive?*

TF2: Yes- that's it exactly. Hyperactive. They suddenly have too much energy and that's just as bad. I didn't believe what I read online about eating too much sugar making kids go crazy but I believe it now. All the girls are bouncing around after the break.

Children's behaviour appears to be doubly negatively impacted by their nutritional intake or lack of this. The earlier comment by TF2 that *"It would actually make teachers' lives easier if the kids ate better"* suggests this might be a good reason for teachers becoming more closely involved in the control of the school canteen. One of the more experienced teachers also felt very strongly that teachers already had enough to worry about without having to take on more information about nutrition:

TF3: *Oh, no, no more courses, for the love of God! [MAKES SIGN OF BEGGING WITH HANDS]. After 10 years, I've had enough of learning new things. There's nothing to stop the authorities from employing food specialists in nutrition to give advice to students about healthy eating.*

6.7.4 Food from home/peer pressure

TF3 who had been in teaching for 10 years had noticed a significant shift in children's eating patterns:

TF3: I think things have changed a lot since I started teaching. All the girls used to bring something in from home and swap food around with friends but not now.

She did not offer any reasons for this change. However, two of the male teachers also picked up on a theme that had been raised previously in relation to bringing food into school from home:

TM4: You won't get your children to take food to school. It's not, it's not, what is it my son always says in American when my wife tries to persuade him to take in home-made food? [THINKS] He says "Mummy, it's not 'cool'" [USES ENGLISH WORD BUT PRONOUNCES IT ODDLY].

TM3: Unless, that is, it's something that's been banned like energy drinks. All the boys at my school think they are ***very*** *"cool".*

This confirms the idea that in some ways, children are quite discerning about what they eat and drink but that their choices are rarely, if ever, based on adult criteria for what constitutes sound nutrition. For the boys, this choice of drink may be influenced by ideas about being grown up or behaving like "cool" male role models.

6.7.5 Social media

Teachers also made mentions of various forms of social media that suggested that this is an important means of raising awareness about issues relating to nutrition and food hygiene. TF4 claims that her colleague “is always tweeting links” to online article about nutrition. One of the male teachers admitted to having shared photographs on Instagram of out of date stock being sold in the school canteen but used a friend’s account so that they could not be linked to him as a teacher and said he was aware of other teachers who had done similar things to show that the inspection system did not work.

6.7.6 Possible solutions

Of those focus group participants who expressed a direct opinion on the issue of government involvement, half thought that this issue required concerted effort in various areas at a level above that of the school itself, either by the Ministry of Education or the local education authority. TM3 expressed the opinion that nothing would get done unless there was a concerted effort that involved both the Ministry of Education and the Ministry of Health or some task force that involved representatives from both areas, particularly those with expertise in nutrition and areas like childhood obesity and diabetes:

> *TM3: In my school, for example, those kids with diabetes and obesity, there’s no thought given to caring for their dietary needs. It’s just the same junk for everyone.*

One of the female participants made a similar suggestion:

> *TF4: It might be useful also if the Ministry of Health was involved. They need experts to help schools by providing better guidelines relating to healthy food.*

Participants also raised a concern about making changes to the current system

> *TM2: I don’t think schools care enough about the financial situation of the student’s family. We’ve got several students with financial difficulties, orphans, for example, or those from immigrant families. They often have very little money to spend and that’s my worry about introducing healthy food – you always have to pay more for it so I wouldn’t want the food to be healthier if became so expensive that poorer children can’t buy it; it needs to be appropriately priced.*

TF4 has previously been at a school where many changes had taken place in the running of the school canteen system thanks to a series of interventions by one member of staff and reflected on the financial impact of this:

> *TF4: A lot of students took part in the Healthy Eating lunch box scheme and the school* (a private school) *absorbed some of the costs because fruit is expensive and staff needed to be paid every day to prepare this freshly.*

Clearly this financial arrangement is unlikely to be an option for those in the state sector with a much more diverse student body.

There was some disagreement about the financial role that the government could be expected to play. However, one of the male participants made an interesting point about government subsidies:

> *TM2: I don't think we could have free meals – that wouldn't be possible but maybe they could be subsidised. If the government provided healthier food at lower prices, they could use all the money that they would save on healthcare to pay for it.*

Two participants who did not think the government should play a greater role in school canteens did however support the idea of it remaining involved with its current role of inspection:

> *TF1. I think the government's role should be limited to what it is now: producing regulations to keep things safe and checking that these are being followed. That's really important. There's always so much in the news about food poisoning. They need to concentrate on that role.*

> *TM4: There's no way the government is going to be able to subsidise school food with the economy as it is at the moment. It needs to put more resources into school canteen inspection. Officials need to be checking health certificates for foreign food handlers. It only needs one person to get through the system and they spread all kinds of infections. Ultimately, safe food is more important than healthy food.*

6.8 Conclusion

This chapter has presented the thematic analysis of information provided by a range of relevant stakeholders. These include a self-selecting sample of parents, teachers and head teachers from primary schools in Medina, together with officials representing the Saudi Ministry of Education in a number of different capacities relating to the current school canteen system in KSA. Some of these stakeholders represent multiple perspectives: many teachers also have

children at primary school whilst some officials have worked in more than one role over the course of their career. The following paragraphs summarise the linkages between the various stakeholder themes, indicating any disparities between them.

Whereas fathers expressed **concerns** about the financial aspects of school food, mothers and teachers emphasised the poor nutritional value of provision and it was clear that mothers were comparing this with school food elsewhere in the UK and USA. Head teachers confirmed this poor quality and also highlighted the limited variety offered to pupils and the lack of provision for those with special dietary requirements. Both parents and teachers linked school canteen food and broader health problems currently prevalent in KSA.

Parents agreed that **breakfast** should play an important role in children's nutrition but acknowledged that, for various reasons, for many children the school canteen snack will represent the first meal of the day. Teachers were concerned about the negative effects that this had on students' behaviour and the MO confirmed that schools had permission to shift break times due to the perceived importance of this meal.

Social media emerged as an important means of raising awareness about health, nutrition and food hygiene issues amongst parents and teachers, and of providing a forum to voice concerns about the shortcomings of the school canteen system.

Parents, teachers and head teachers observed that schoolchildren are subject to **peer pressure,** potentially affecting their eating habits. While school staff were also aware of the problems caused by the overcrowded canteen facilities highlighted by parents, teachers were unwilling to assume responsibility for any extra tasks relating to school food provision or nutrition education.

Both the MO and SCI highlighted the importance of the **home environment** in establishing good eating habits and mothers were still recognised as playing the key role in nutrition within the household. However, unlike the MO, the SCI did not criticise parents for failing to engage with school initiatives relating to nutritional education.

While the MO emphasised that the inspection process ensured compliance with regulations and legal requirements both the SCI and head teachers thought that

financial matters took precedence. Parents expressed doubts about the effectiveness of the current process and suggested there was a potential for abuse due to the economic interests involved. Teachers also felt that the funding mechanism encouraged head teachers to maximise profits by buying poorer quality food but were divided on whether government subsidies would be helpful. Head teachers acknowledged the difficulties of striking a compromise between legislative, regulatory, financial, nutritional, and educational priorities.

While there was considerable overlap in the problems identified by the various study participants, there was less agreement about whether governmental or local **solutions to school food provision** would be most effective. Teachers highlighted the importance of collaboration between the Ministries of Education and Health to tackle links between nutrition and broader health concerns and agreed that the government should retain responsibility for inspection. Mothers also saw the value of concerted efforts at a level above that of the school itself but, like the fathers, they emphasised the need for a more integrated approach at school level, involving curriculum content and input from appropriate experts to change children's attitudes to eating. Creating food links with the local community via the Productive Families Project was favoured by mothers while the head teachers pointed out that knowing the provenance of products can be reassuring. However, the latter also acknowledged that relying on local suppliers is open to financial abuse if contracts are awarded on the basis of kinship/friendship rather than cost or quality.

In the following chapter, key emergent themes for all these groupings will be presented and examined for patterns and associations with the data from the quantitative survey. The ultimate aim will be to reveal important similarities and differences in the discourses used by various stakeholder groups that would need to be taken into consideration to ensure the success of any future policies and interventions aimed at providing healthier food choices in the school setting, intended to contribute to combating the current childhood obesity crisis.

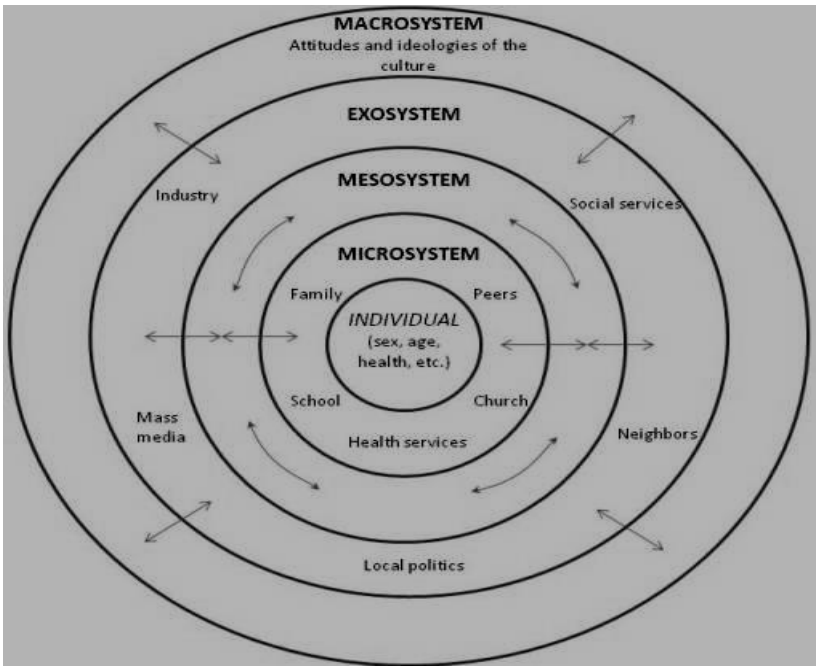
7 Chapter Seven: Discussion

7.1 Introduction

In this chapter, the results from the parent and teacher questionnaires, from the focus groups and interviews are compared with existing research regarding young schoolchildren and the factors that influence their nutritional health in the school food context. Where possible, research that is relevant specifically to KSA has been used. The aim here is to synthesise these findings and use them to address the research questions posed at the start of this study. The findings in this chapter will also serve as the basis for a series of recommendations in the concluding chapter of this thesis concerning how school food provision for Saudi primary school children could be improved and make a more positive contribution to combating childhood obesity in KSA. The chapter also considers the limitations of this study and it is acknowledged that this study was carried out in Medina, an urban location which is not necessarily representative of KSA as a whole.

7.2 The nutrition environment of 6-12 year-olds in KSA

Figure 7.1 Bronfenbrenner's ecological framework for human development (1979)

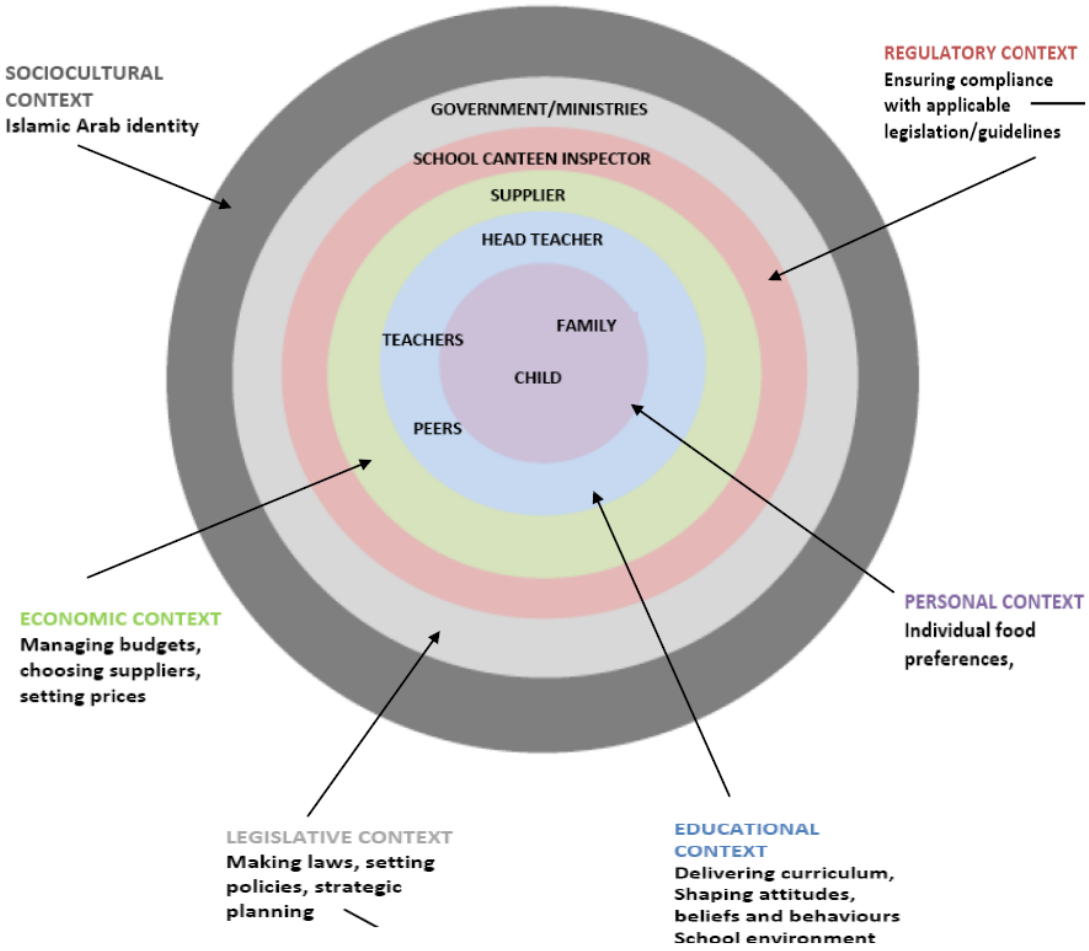


(Source:Chokr https://commons.wikimedia.org)

At the start of this thesis, Glanz et al.'s (2005) socio-ecological model was employed as a useful means of better understanding the role that school food

currently plays in the nutrition environment of 6-12 year-olds in KSA. However, it became clear that since this was originally evolved within a western democratic framework, this does not always fit the contours of Islamic societies, particularly that of KSA. Here, findings from this study have been synthesised into a model based on the concentric circles format originally employed by Bronfenbrenner (1979) (Figure 7.1) as this better represents the Islamic worldview in which all things are ultimately encapsulated and influenced by religion.

Figure 7.2 The nutrition environment of school food for 6-12 year olds in KSA



This new model (Figure 7.2) represents a simplified overview of the complex relationships between the multiple contexts or dominant forces that may shape a Saudi schoolchild's food choices, namely, sociocultural, legislative, regulatory, economic, educational, and personal. It also identifies some of the key players within these contexts. It is important to note that each of these contexts influences all the other contexts.

The key finding of this thesis is that if school food provision is to play a role combating the childhood obesity crisis in KSA it is vital to look not only at the nutritional quality of the foods which is on offer but also to understand which factors influence the provision, selection and consumption of that food. Food choices are influenced and often ultimately determined by not only our own personal food preferences but by the multiple contexts in which that food is supplied, selected and consumed (Story et al., 2008).

Saudi children between the ages of 6 and 12 spend at least 35 hours each week in the educational context and their food choices, patterns of consumption and eating behaviour may be influenced there in multiple ways. As the model shows (Figure 7.2), the school operates within the sociocultural environment in which attitudes, beliefs and norms of appropriate behaviours are communicated and encouraged by teachers and shaped by interaction with their peers. Simultaneously, the educational context is subjected to the legislative context of state policies that, amongst other things, cover the content of the Saudi national curriculum and the level of school funding, and also a regulatory context that includes inspection for compliance with government food safety rules and guidelines covering provision. It is also apparent that the economic context often effectively determines what food choices are available to children, both in terms of what is on offer with the school environment and what families can afford.

In KSA, the contextual elements of this model would be similar for either a public or private sector institution as all are subject to the same regulation and legislation but within the educational context the importance of the role played by stakeholders, such as parents, may be greater. Figure 7.2 also identifies some of the individuals, institutions, organisations and processes which play a major role within these contexts. The sections which follow provide key findings on each of these contexts based on information gathered from various sources including official documentation, analysis of interviews, focus groups, and questionnaire responses and the researcher's own observation in school and her experiences as a Saudi citizen and mother of two young sons educated in the state sector KSA.

7.3 The sociocultural context

The sociocultural context encompasses all the other five contexts because as an Islamic Arab state, every other context in KSA is conditioned by the precepts of this religion. This extends from the legislative context covering the form of government and the legal framework within which it operates (the principles of *Shari'a* law) to the personal context, since individual food choices for a practising Muslim are governed, for example, by the concept of *halal* and of fasting during Ramadan. Thus, any changes to the school food system would need to be appropriate to the specific Islamic sociocultural context of KSA for them to be deemed acceptable.

7.4 The legislative context

This context covers the making of laws, setting policies, strategic planning (such as 2030 Vision, also known as the National Transformation Plan, recently launched in KSA) and the interventions proposed by Ministries, agencies and organisations to achieve governmental goals. Decisions made in this context can theoretically have a significant impact on the public health of citizens. Children's healthy lifestyle behaviours including food choices can be directly influenced by means of policies and guidelines that limit availability of certain foods (for example, the ban on selling energy drinks in primary schools) or that change curriculum content (for example, encouraging physical education for girls).

Commenting on the weaknesses of the administrative system in KSA, Kannan (2012: 137) noted "Fragmented institutional arrangements frequently result in conflicting policies, political competition between agencies and lack of a comprehensive and coordinated policy". Comments made by focus group participants highlighted examples of an apparent lack of coordination between the Ministries of Education and Health in the context of broader policy and strategy in relation to school food reflected in the lack of connectedness between the various policies affecting the health of Saudi school children. Analysis of the school canteen inspection process highlighted that the area of School Health Services was viewed as the responsibility of the Ministry of Education, despite the obvious need for the Ministry of Health to be involved in strategy and policy decisions in this area. This lack of coordination may point to

difficulties in implementing strategic planning that would link school food provision to the broader issues of child obesity.

A number of the questionnaire items focused on areas of ministerial responsibility and although these were not originally designed to assess respondents' attitudes towards 'joined up thinking' at governmental level, they provide a useful point of reference here. Teachers' views were particularly sought in this area since they are better placed to judge past performance in educational policy and whether areas currently under the responsibility of the Ministry of Education (MoE) might be better looked after elsewhere. As previously noted (section 6.2.2) when interpreting these results it should be borne in mind that Saudi state employees may engage in self-censorship when asked to express direct opinions about the government, for various reasons.

Both parents and teachers were overwhelmingly positive about the MoE's capabilities of establishing and implementing a national school meals programme (Table 5.5). As to whether the MoE should retain its current responsibility for regulating school food provision, again both groups of stakeholders overwhelmingly agreed that it should (Table 5.16). However, when teachers were asked if responsibility for tasks currently carried out by the MoE might be better dealt with elsewhere (Table 5.17), over 90% of respondents thought the Ministry of Public Health should provide national guidelines concerning hygiene standards for food sold in schools. Teachers showed an even higher level of support in favour of the Saudi Medicines and Food Authority assuming responsibility for issuing specifications and standards covering nutrition aimed at school students (Table 5.17). Thus, teachers appeared to be open to the idea that there might be alternative ways for the system of school food provision to operate within KSA.

Laws and policies can also influence social norms more indirectly, for instance, by issuing guidelines to the media about advertising certain products to vulnerable groups or even banning some products from being advertised at all. The study showed that children are perceived by adults as vulnerable consumers because they are unaware of the potential long-term harmful effects on their health that could result from their food choices and from the poor nutritional quality of what is available at the school canteen. Moreover, they are seen as being easily influenced as consumers and prone to exploitation.

Parents talked about children being attracted by appealing packaging and brightly coloured products and demonstrating brand awareness as a result of the marketing efforts by food and drink companies. There was also evidence that some potentially harmful branded products may carry positive connotations for students, for example, even at primary school, boys had linked energy drinks to being grown up or behaving like “cool” male role models.

There has long been concern in the developed countries about the impact of what Glanz et al. (2005) refer to as the information nutritional environment and the impact that advertising may have on children’s food choices (Harrison and Marske, 2005; Cowburn and Boxer, 2007; Buijzen *et al.*, 2008). As a result, there have been many calls for governments to legislate on this, including one by the International Obesity Task Force in 2004 that recommended a ban on marketing of high fat/sugar/salt products to children via promotion on television and other media (cited in Alghamdi, 2009). A relatively small body of work has been done on this area in KSA but recent Saudi studies suggest that branding and advertising can negatively influence young consumers, persuading them to view food in terms of its ‘entertainment value’ (Alkharfy, 2011), promoting the intake of energy-dense snacks (Aljaaly, 2015) and consumption of caffeinated energy drinks (Aljaloud, 2016). Branding, in particular, has the potential to exacerbate peer pressure by highlighting social and economic divisions between those children who can afford branded food/drink products and those who cannot (see section 7.7.2 on school food choices and peer pressure).

7.5 The regulatory context

The interaction between the legislative and the regulatory context is important. Without an effective inspection system to ensure compliance with applicable legislation, policies and government guidelines, the effectiveness of these in protecting public interests will be limited and this impacts on accountability and transparency in an area of public health which is of interest to all Saudi society. This effectiveness depends on the quality of inspections and the knowledge and skills of inspectors implementing them, and this area is often noted by international organisations as one of weakness in developing countries (Jacobs and Cordova, 2005).

Interviews with past and present school canteen inspectors revealed that none had any specialist qualifications or expertise in child nutrition. Moreover, current

School Canteen Regulations (section 2.4.7) confirm that there may not even be any nutritional expert on the committee itself. It was also evident from interviews that the inspection process tends to focus on using a yes/no checklist system which does little to help schools comply better with the 'spirit of the law' in which guidelines are intended to improve nutritional standards.

Moreover, any caterers involved in providing food to the school canteen are simply given a copy of the regulations and told to comply with these. They do not appear to be given any supporting guidance about specific ways in which they could make their offerings healthier. In the case of the UK, it was found that caterers providing school meals only made changes when nutritional standards rather than guidelines were introduced (Moore, 2011) and this may point to the need for stricter monitoring in the KSA context.

Under the current process, no recognition is given to schools which consistently perform above and beyond the bare minimum requirements and offer children high quality food choices and maintain an excellent standard of food safety and hygiene. Information about the results of school canteen inspections is not available in the public domain. Moreover, it became clear from what was said in interviews that the regulatory context and the economic context are bound together in the Saudi system since inspectors are also responsible for checking school food finances. This twin role for inspectors is at best unhelpful and, at worst, could be considered to have the potential for abuses such as collusion and corruption (Jacobs and Cordova, 2005).

7.6 The economic context

At the macroeconomic level, the state of the nation's economy determines the financial resources available for services to citizens. However, at the more localised level of the local authority and the school itself, decisions concerning the allocation of financial resources and the management of the school budget have the potential to impact directly on the food choices available to pupils in the school canteen. Currently in the public sector system, school food provision is typically reliant on one supplier chosen by the head teacher who acts as a very significant 'gatekeeper' in determining children's food choices. The choice of supplier is ultimately a financial decision since aspects such as nutritional value or quality of the products do not feature in the tendering process.

Comments made in interviews and by focus group participants suggest that the current funding mechanism appears to be a key factor in determining what is sold at the school canteen and this means there is potential for abuse in a number of ways as the school canteen represents a lucrative source of income for the school itself, for the Ministry of Education and for the operator supplying the canteen. Participants' comments suggested that bad practice such as selling food prohibited under current guidelines might be motivated by the head teacher's desire to bring in bigger profits in order to benefit school funds or by the school food canteen operator attempting to raise their profit margins.

The Lebanese school food system is operated on a similar basis to that which exists in KSA and during her intervention to encourage healthy eating and physical activity with school children in Beirut, Habib-Mourad (2013) found that the efforts of the intervention team were undermined by the lack of cooperation from the operator of the school food shop. He wanted to continue selling the kind of unhealthy snacks that the children liked and even offered free goods to the head teacher that could be used to increase profit margins.

The current lack of transparency in the system of awarding contracts to school canteen caterers means that providers may win contracts on the basis of kinship or personal connections (still a common practice in Arab societies and an example of the pervading sociocultural context)[38] and this may also increase the possibility of bad practice being ignored. This emphasises the need for a robust independent inspection system in the regulatory context to ensure that nutritional standards are not sacrificed for the sake of profits.

The school canteen represents the only source of food for children at school and although in theory there are regulations covering the prices that can be charged, there were suggestions from focus group participants that schools may not always adhere to these regulations or enforce them diligently. Pricing policies and the actual prices for the food sold in the school can ultimately be decided by the head teacher with little, if any, consultation with parents. Although KSA is an oil-producing country, there are still many families who are not financially well off, reflected in the fact that the Saudi government has had a

[38] As Barnett et al. (2013: 2) note: "For those who work and live in Middle Eastern societies, *wasta*, which may be thought of as special influence enjoyed by members of the same group or tribe, is an ever-present part of life […] deeply embedded in the fabric of these societies".

national strategy to fight poverty since 2002 (Alnuaim, 2013). A report based on an urban development survey which focused on the Greater Medina area in 2007 found that 14.2% of the families there were living below the poverty line (Ghafour, 2007). This situation may have worsened as the Saudi economy has contracted due to the drop in oil prices.

Questionnaire results concerning the daily amount of money that parents thought a child should be given for school food were fairly evenly split (Table 5.12). The fact that these ranged from 2-4 riyals at one extreme to 11-15 riyals at the other may be indicative of differences in socioeconomic status amongst respondents in the sample or may also reflect family size as those with fewer numbers of children may have to spread their financial resources accordingly. However, the fact that over 80% of parents and teachers surveyed believed that some Saudi families could not afford to buy food from the school shop, together with parents' overwhelming support for the reintroduction of a programme of free school meals (Table 5.12) emphasise the relevance of the economic context when looking at school food provision in KSA.

The previous experiences in KSA with the School Feeding Programme (section 2.4.3) and the School Milk Programme (section 2.4.4) illustrate how finance can influence the success or failure of a nutritional intervention in the school context. Vulnerable families may suffer from badly thought out plans to improve school food provision while, at the opposite extreme, other parents may refuse to support initiatives which they think stigmatize them socially. This could be even more sensitive if changes to school food provision are overtly linked to childhood obesity. Habib-Mourad (2013) found that some Lebanese parents refused to attend meetings related to her healthier eating project as they viewed it as treatment for childhood obesity and felt this reflected badly on them as parents, illustrating how emotive the topic of child nutrition can be.

In its School Policy Framework document relating to diet, physical activity and health, WHO (2013: xiii) notes that "school feeding commonly forms part of the entire social protection system that supports the most vulnerable families and their children". Therefore, it would be important to bear this in mind if major changes were to be introduced that would raise the cost of what is available. When the UK government decided to change school meals provision, it set aside money to subsidise new provision for a 'bedding-in' period (WHO, 2013)

and the Saudi government may have to think about committing resources in a similar way to avoid jeopardising vulnerable families. A pricing policy which subsidises fruit, similar to the School Fruit and Vegetable Scheme in the European Union (Faulkner et al., 2011), could also have a positive impact on children's eating behaviour in this nutritional context but funding would need to sustainable to ensure long-terms benefits (see 7.7.4).

Comments by focus group participants and interviewees, together with questionnaire results all pointed to the inadequacies of the current school canteen facilities in KSA suggesting that significant funding would also be required to upgrade canteen facilities if a school meals system of the kind currently offered in the UK were to be implemented. It is worth noting that when the UK government announced in 2014 that it would fund free school meals for primary school pupils it also made available a £150m capital fund to help finance the structural changes needed to upgrade existing school facilities (Dimbleby, 2014).

7.7 The educational context

7.7.1 Stakeholder opinions on changing the existing system

This context constituted the core focus of this study. Parker (1997: 25) notes that the "foundations for a healthy life are substantially laid down in childhood". From a nutritional perspective, clear links need to be made between the type of food sold in school canteens and some of the broader health concerns that are currently prevalent in schools in KSA, given that the survey results showed that over 90% of the parents surveyed indicated that their children bought food from the school canteen (Table 5.3). Despite the fact that the prevention of childhood obesity has been recognized as a public health priority in KSA where consecutive studies have revealed the alarming growth in prevalence rates of overweight/obesity in Saudi children and adolescents (Table 3.3), the type of food that is typically on offer in primary schools does nothing to address this fact. Tooth decay has also been recognised as a major concern amongst young school-age children in the Kingdom but school canteens continue to serve cariogenic food (Togoo *et al.*, 2012). One of the most striking elements to emerge from the parent focus groups was the overwhelming dissatisfaction that they expressed with multiple aspects of the current school food provision.

Results from the questionnaire items suggested the majority of both parents and teachers would welcome a new form school food provision that incorporated cooked meals for pupils into the daily schedule of state primary schools in KSA (Table 5.11). When teachers were specifically asked if they thought changes arising from the introduction of school meals system would be accepted by their colleagues over half of those surveyed agreed, more than one in four disagreed to a greater or lesser extent, and over 10% were not sure. Given that most Saudi teachers in the state sector currently play no role in school food provision these results may indicate fears that change would entail an extra workload and they emphasise that any major policy changes would need to carefully consider the degree to which changes would impact on these stakeholders to guarantee their support. As the School Milk Programme showed (see 2.4.4), the cooperation of this group of stakeholders is vital to ensure the success of healthy eating initiatives in the school setting.

When asked about their preferred option concerning the form that future school food provision might take, the majority of both parents and teachers stated they would prefer the school to hire a catering company to source, buy, prepare and serve meals to children (Table 5.19). The reasons that respondents gave to explain their choice provided useful insights into perceptions of the shortcomings of the current system, many of which reflected points made in focus groups.

Many respondents thought external caterers would produce healthier food and would be more professional, particularly regarding food safety and hygiene. Interestingly, other respondents opted for an in-house solution because they thought this would reduce the incidence of food poisoning, an issue which was also frequently referred to by focus group members. This suggests that levels of trust in food prepared outside the home may be low. Recent figures collated by the General Directorate of Environmental Health concerning violations of Food Safety and Hygiene regulations in Saudi food establishments (see 6.3.1) and the literature review by Mohamed et al. (2010) suggest these fears may be well-grounded.

In addition, many respondents opted for hiring external caterers on practical grounds because current school facilities for food provision were inadequate. This highlights the lack of facilities currently available in state primary schools in

Medina, and also points more widely to the amount of investment that may be needed to create adequate school meals provision in KSA.

Most respondents who chose in-house provision emphasised the advantages that this would have for children on the grounds that school staff would know pupils' needs and their comments made it clear that this related to the financial situation of their families and also their cultural background as well as to food allergies/intolerances and health conditions such as diabetes. They argued that knowing this information would make it easier for suitable food to be provided. This reflects concerns voiced by parents in focus groups who were highly critical about the lack of provision for students with special dietary requirements. Comments from official interviewees appear to suggest that this is not considered part of the school's responsibility towards its students and currently the Saudi system does not appear to have any policies in place for dealing with this. This is despite the fact that current levels of childhood obesity are also leading to a marked rise in diabetes in the younger age groups while there is also evidence that the numbers of those found to be suffering from food allergies is increasing in KSA (Boye, 2012).

7.7.2 School food choices and peer pressure

The study found evidence of the effects of peer pressure on children's food choices that suggested that personal food choices in the nutrition environment of the school may also be linked to aspects of identity such as class and gender. Two items in the questionnaire explored parents' attitudes to providing home-made food for children to take to school rather than buying from the school canteen (Table 5.3). It was anticipated that parents would judge home-made food to be a healthier and/or cheaper option but would think it was more difficult. However, respondents were only marginally in favour of this and virtually evenly split on whether it was more difficult to provide this. Their reasons for giving these responses were illuminating and corroborated points raised by both parents and teachers in the focus groups. The most popular reason given for providing money to children so they could buy from the shop was not time pressure or convenience but peer pressure.

Parents recognised that anything that marks out a child as being 'different' from his/her classmates is not welcomed by him/her. At the very least, it can lead to feelings of embarrassment at being the odd one out while, at worse, it can entail

having to face ridicule for being labelled as socially inferior or coming from a poor background. There also appeared to be a gendered element to this peer pressure since there was also evidence of children wanting to conform to what were perceived as gender norms relating to eating habits at school for example, it was not judged suitable for boys to take fruit to school as this had negative connotations as being associated with girls. There was also evidence that these perceptions might be reinforced by parental attitudes.

Parental awareness of peer pressure may go some way to explaining a somewhat contradictory finding in the questionnaire. Surveyed parents overwhelmingly supported the suggestion that schools should restrict the type of snacks sold to children to fruit portions only, with nearly two-thirds feeling very strongly about this issue (Table 5.8). Fruit also features as the third most popular snack choice for 6-12 year-olds at home. However, results also showed that the most popular snack food provided for children in this age group to take to school as reported by parents was the sandwich while both biscuits and crisps were also more popular than fruit (Figure 5.1). Participants' comments about peer pressure may explain this discrepancy between their support for only selling healthy snacks and their failure to provide this for their own offspring.

Ludvigsen and Sharma (2004) carried out research on food choices at school with a sample of UK school students aged 4-15 and noted that: "What children eat clearly categorises them in each other's eyes in the same way that the clothes they wear, or their interests do" (Ludvigsen and Sharma, 2004: 23). They also found that "there appear to be very strict, if unwritten, rules among the children about what you can and cannot eat while at school" (Ludvigsen and Sharma, 2004: 33). In addition, they observed that gender played an important role in what was classed as acceptable among children and young people and that "choosing to be different by eating 'strange' healthy food is clearly very hard for girls, and just about impossible for boys" (Ludvigsen and Sharma, 2004: 33). They concluded that food appeared to be something "that can make children and young people stand out from the crowd" (Ludvigsen and Sharma, 2004: 35) in a negative sense. This was reflected in the fact that all the groups of children and adolescents participating in the research "were able to give examples

where they or other children in their school had been bullied or laughed at because of what they ate" (Ludvigsen and Sharma, 2004: 34).

The findings from this Saudi study and from Ludvigsen and Sharma's (2004) UK-based research emphasise that the role of school food for children is not merely nutritional but needs to be understood as being intrinsically linked to their self-identity in relation to their peers, even at primary-school level. This may help to explain why studies on encouraging healthier eating habits at school reported that peer-led interventions had the potential to bring about positive changes in levels of knowledge, confidence and attitudes in relation to food consumption (Gibson, 2007; Habib-Mourad, 2013). This in turn points to the importance of involving children in any proposed changes to school food provision since "understanding the worlds of children, and the meanings food has for them, is essential if we want to influence their choices in healthier directions" (Ludvigsen and Sharma, 2004: 5).

7.7.3 Parental engagement and voice

While there was evidence from the focus groups that parents feel responsibility for acting as role models for health eating within the home, over two-fifths of questionnaire respondents expressed doubts about the level of influence they exercised over children's food choices in the school environment (Table 5.4).[39] At times, comments made by parents in the focus groups indicated an underlying sense of powerlessness and lack of voice since they could not see how they could influence the implementation of change that would impact positively on the general running of the school canteen and on their children's diet. Little evidence was found of concerted attempts to engage parents who can be of crucial importance in determining children's food choices.

Lucas notes that "parental engagement […] is central to what schooling should be in the 21st century" (2013: 7) but as previously noted (Chapter Two), in the state education system in KSA, there are currently no formal structures that allow parents to make their voice heard on issues that affect their children's education and their general well-being. As Al Otaibi notes of the education system in KSA, "citizens do not have a strong political voice; [there are] no

[39] Interestingly, there was some evidence from the focus groups that children were able to exercise influence over parents with regard to food by strategies of resistance (refusing to take home-made food to school or to consume this) and persuasion (also referred to in marketing as pester power [McDermott et al., 2006]).

changes unless agreed by school leaders" (2014: 8). Focus group participants acknowledged that in theory individual parents are free to raise issues directly as and when they occur with head teachers or Ministry officials but in practice, for various reasons, not all parents would be willing or able to do this.

The results of this absence of formal structures that facilitate parental involvement were reflected in comments made in the focus groups by parents. Some appeared to be unaware about various key aspects of the operation of the school canteen such as guidelines on prohibited food stuffs, food safety/hygiene regulation; control, inspection and monitoring within the school itself and beyond school level, for example at ministerial and local authority level. This may explain why they sometimes expressed a lack of confidence in current control mechanisms and processes as they felt there was no transparency about the level of their effectiveness or any real accountability in relation to this. Some of the comments made by parents also pointed to their feelings of frustration at the apparent lack of co-ordination between governmental or school health policies and the functioning of the school canteen.

However, discussion in the focus groups suggested that parents now use social media (in particular Twitter) as an informal forum for airing concerns about issues that cannot be raised formally elsewhere (for example, reports of food poisoning incidents at Saudi schools from the press are re-circulated with comments). Social media is also used for venting frustration at the current state of affairs regarding the school canteen system (for example, complaining about the sale of mouldy food or out-of-date items). Parents also share information on social media about nutrition-related matters.

Research about the growing impact of social media in KSA as "a new form of public sphere" (Albakhail, 2016: 1) shows that these focus group participants are not unusual in their use of social media. Studies have already identified the potential that this medium in general and Twitter in particular has for raising awareness about health concerns in KSA (Bahkali et al., 2015; Albalawi and Sixsmith, 2015). It has also been used for co-ordinating campaigns relating to the need for improvement in the current education system and there is

increasing evidence that the Saudi authorities are starting to respond to issues related to public health concerns that are raised on social media. [40]

7.7.4 A whole school approach to school food provision

Despite the major reservations expressed by the parents in the focus groups about the nature of the current provision, the parents who were surveyed clearly saw the potential that a school meals programme might have to positively influence primary school children's attitudes to healthy eating, with over 90% agreeing it would have this effect. This is even though there is no well-established tradition of school meals' provision within the Saudi education system, unlike in the UK, for example.

However, when asked if they thought a school meals programme would improve the health of primary school age children in KSA, opinions were divided (Table 5.6). These results are difficult to interpret and differ very considerably from those for the teachers surveyed who were overwhelmingly in agreement with both these statements. The fact that 37% of parents disagreed could have two very different implications: either they do not see a strong connection between nutrition and health, or they think that an initiative on nutrition/school food would be insufficient to improve children's health. Comments made by the focus group participants would support the latter interpretation but as previously noted, these parents may not be representative.

The fact that over three-quarters of parents agreed that the Saudi government should prioritise the establishment and regulation of minimum nutritional standards for school food provision (Table 5.7) also supports the latter interpretation, since it suggests that they understand the importance of nutrition but think that this alone will not be sufficient to improve children's health. This viewpoint is supported by research on the multi-factorial aspect of childhood obesity generally (Pearson and Biddle, 2011) and specifically in KSA (Al Ghamdi, 2009; Al-Hazzaa et al., 2010, 2011).

Both parents and teachers were overwhelmingly in agreement with the proposal that a school meals programme should form part of a broader programme

[40] In 2016, *Al-Hayat* was one of a number of Saudi publications to report how a social media initiative launched by parents led to the Ministry of Education agreeing to fund a new initiative that would ensure that all state schools with over 100 students in KSA had a named individual trained to provide first aid, to refer pupils on to casualty or walk-in healthcare centres when needed and to liaise with students' families.

intended to improve health and nutrition within every state primary school (Table 5.18). In so doing, they effectively endorsed the adoption of what is commonly referred to as a whole school approach to children's health and wellbeing. This would entail linking school food provision to broader concerns about children's health issues by creating curriculum links to health, nutrition and physical activity, and instituting public health policies underpinned by socio-ecological theory (Moore, 2011).

The UK National Governors' Association offers guidance about how to implement a strategic policy framework between schools. This makes a number of important points about how a school can ensure that its school food policy is fully integrated with other school policies. It also stresses the importance of involving all stakeholders in order to ensure that school food "is central to its thinking and not seen as a peripheral issue" (National Governors' Association, 2007:4). The guidance notes that:

> Successful approaches are those in which messages about food and nutrition taught in the curriculum are echoed and reinforced by the type of food and drink provided in school through catering, tuck shops or vending machines. These approaches are planned and systematic, involve teachers, caterers, parents and pupils, and encompass the overall ethos and environment of the school (National Governors' Association, 2007:3)

Parents and teachers in the focus groups identified the need for integrating nutritional awareness within the school curriculum and thought that one solution would be to employ trained professionals with expertise in nutrition to educate children about healthy eating. Various studies have pointed to the importance of including health education and information to encourage the formation of healthy eating habits and an active lifestyle in the school curriculum as a proposed solution to childhood obesity (Adelman et al., 2008; Al-Sibai, 2012; Hartmann et al., 2013). In the Saudi context, Al-Almaie's (2005) study concluded that knowledge of healthy diets among Saudi schoolchildren was inadequate. Farghaly *et al.* (2007) advocated that future healthy eating interventions in KSA should take a holistic lifestyle approach and that healthy lifestyles and dietary habits should be nurtured in children by means of health education. As part of its Global Strategy on Diet, Physical Activity and Health, the WHO has recognised the crucial importance of the diverse ways in which

schools can help to promote healthy lifestyles, in particular, good nutrition (WHO, 2008).

Suggestions were also made by focus group participants about the need to promote healthy lifestyles within the school that would help to change attitudes towards eating, and that this information needed to target not only children, but also staff and parents. In the UK context, the Children's Food Trust (online) emphasises that in order to implement any successful change relating to school food, the school must attempt to engage a wide range of stakeholders. As noted in section 7.8.2, there is evidence that parental involvement in school-based interventions designed to encourage healthy lifestyle behaviours in children is essential.

The Governors' Association guidance document makes another important point about the need to attempt to engage everyone in making changes rather than relying on enthusiastic individuals:

> While it is true that in some schools a single 'champion', be it a teacher, governor, school nurse or parent, has provided the impetus and made great strides to implement aspects of a food policy, such an approach is always at risk as it may not be sustained if the 'champion' moves on. (National Governors' Association, 2007: 4).

A good example of an unofficial 'champion' was provided by participants in the female teachers' focus group who highlighted how a single member of staff could have a significant impact on school food provision and on spreading the healthy eating message within the school environment. However, it was clear that although this individual was highly influential, comments from participants suggested that she was the only member of staff with this level of knowledge, enthusiasm and interest, making it likely that there would not be anyone else who would be able or willing to play a similar role if she left the school. A single individual of this type is also vulnerable to being considered overbearing/judgemental with regard to nutrition as comments from staff hinted.

Few of the participants in the study raised the issue of the role that physical activity could play in promoting a healthy lifestyle amongst school students despite the fact that for nearly two decades researchers have noted that this is a problematic area for young people in KSA and one that affects broader Saudi society (Al-Refaee and Al-Hazzaa, 2001; Mahfouz et al., 2008; Al-Hazzaa et al.,

2013; 2014). When visiting school premises in the urban setting of Medina, the researcher observed that most have limited space that could be used for physical activities due to rapidly expanding numbers of students.

Moreover, as previously noted (section 6.4.4), in Islamic countries the architectural structure of girls' and boys schools may differ, meaning that outdoor facilities for play are restricted in the former case. In addition to these practical problems, some religious conservatives in KSA, both men and women, remain opposed to the introduction of physical education for girls, as they link this issue to broader debates about upholding religious and cultural traditions (Human Rights Watch, 2012). For all of these reasons, careful thought would need to be given to how physical activity could be successfully incorporated into the curriculum.

It is important to acknowledge that relying solely on the educational context of the school to improve the food choices of children as a means to address obesity and other public health issues has its limitations. Useful lessons can be drawn here from studies of school-based programmes intended to increase fruit/vegetable intake in children.

In order to inform EU policy on agriculture and public health, De Sa and Lock (2008) conducted a systematic review of literature on school-based interventions to promote fruit/vegetable consumption in children based on the five-a-day principle, examining their degree of effectiveness and identifying the factors likely to make these successful. The 34 articles they reviewed incorporated 19 studies specifically targeting children aged 11 or under. These were conducted in the US, Australia and the EU, and included evaluations of the national Five-A-Day School Fruit and Vegetable Scheme in the UK.

De Sa and Lock (2008) found that all of these studies reported a statistically significant increase in fruit/vegetable intake at some stage during the intervention. An increased level of consumption was also maintained at follow-up >1 year in 16 of these studies. However, with specific reference to targeting obesity reduction, only one succeeded in producing a positive impact on both fruit/vegetable consumption and BMI (Taylor et al., 2007).

On the basis of their review, De Sa and Lock (2008) identified a number of factors that were likely to improve the effectiveness of school-based interventions aimed at increasing fruit/vegetable intake in children:

- Interventions consisting of multiple components and supporting activities were found to be most effective at increasing consumption of fruit/vegetables in the longer term. Those interventions that focused solely on the school environment, even when they included targeted curriculum input, did not report any significant positive impact on fruit/vegetable intake.
- The most successful interventions combined changes to all in-house school food provision (including tuckshops and vending machines) and an educational component with parental involvement, motivational support and incentives for children, and food-related activities such as gardening, cooking or food tasting.
- Provision of free or subsidized fruit/vegetables, such as the UK Five-A-Day School Fruit and Vegetable Scheme produced statistically significant increases in intake during the scheme. However, there was evidence that large-scale schemes of this type are not sufficient to produce long-term dietary changes if they last for less than a year, highlighting the importance of sustainable funding for initiatives of this type.
- Increasing accessibility and availability of fruit/vegetables were found to be important determinants of intake in schoolchildren (see 7.8.3)

The authors (2008) also provided a useful overview of the stages in the organization and delivery of school fruit/vegetable schemes that merits reproduction here since it also serves to illustrate the multiple factors and players that can influence any school-based programme or initiative designed to improve nutrition in the educational context.

De Sa and Lock (2008: 586) concluded that “Policy-makers […] need to understand that multiple changes in social, economic and physical aspects of children's environments are also likely to be required to sustain increased fruit/vegetables intake, and that schools are only one aspect of this”. Links between school food initiatives and broader public health policy are made in the Recommendations section of the concluding chapter of this thesis (see 8.3).

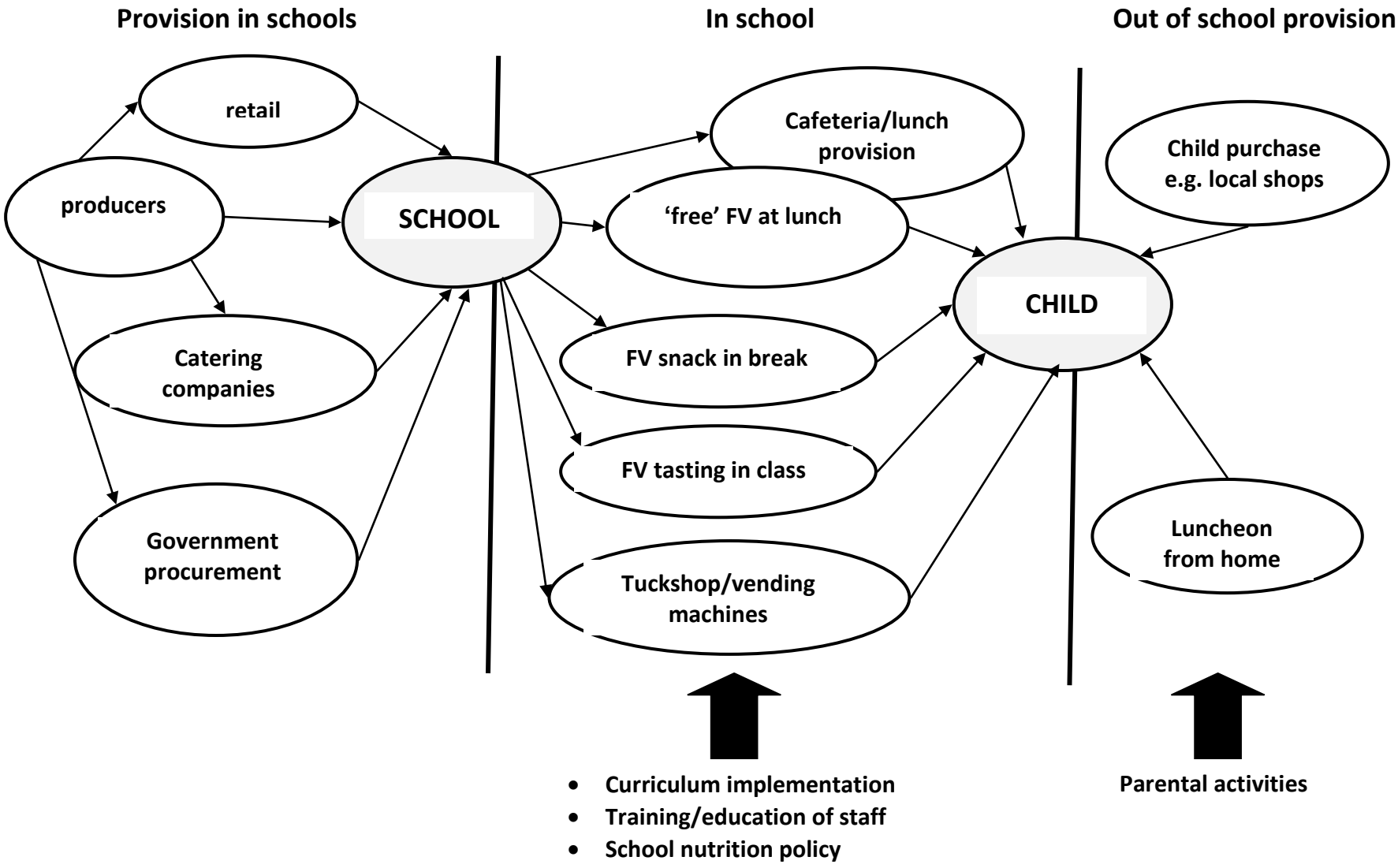


Figure 7.3: Stages in the organization and delivery of school FV schemes

Key: FV = Fruit/vegetable

7.7.5 Ready for change?

In order to gauge if stakeholders believed that the current education system was in a sufficient state of preparedness for changes to the system of school food provision, both parents and teachers were asked if they thought schools had the necessary financial and human resources to implement a new policy on school food provision for state primary school pupils (Table 5.13). There was a very marked difference in responses from the two groups. Over 80% of parents thought there were sufficient financial and human resources while one in three teachers disagreed with this statement and a further 22% were unsure. In addition, analysis showed a statistically significant difference in the views of male and female teachers. The reason for this is not clear but is it not necessarily linked to gender and may relate to the area of Medina where respondents teach, since school resources may be more stretched in certain neighbourhoods due to the socioeconomic profile of pupils' families.

Two further questionnaire items were used to specifically gauge teacher views on the state of preparedness of the current system since they were judged to be in a better position to assess this on the basis of their experiences within their own schools. Over 60% of teachers agreed that schools in KSA had the necessary resources to implement a nutritionally balanced school meals programme that would meet international standards (Table 5.14). An even higher percentage of respondents from this stakeholder group (over 70%) stated they were fairly, very or totally confident that their own school would be able to prepare, cook and serve high quality, safe meals to students (Table 5.14).

It is difficult to interpret the apparent discrepancy here between teachers' lack of optimism about the adequacy of human/financial resources to face changes (Table 5.13) and their higher level of confidence about general preparedness of the sector to meet international standards and about the preparedness of their own school (Table 5.14). However, this could simply be a matter of emphasis in the wording of these items. If teachers interpreted TQ11 as asking them if schools have enough resources, then it is highly likely that respondents will answer 'no'. However, when respondents are asked: are your resources as good as those elsewhere? (TQ5), then it could be argued that they are more likely to be predisposed to answer 'yes'. This may be particularly likely if they

perceive the point of comparison to be a vague one (i.e. because they do not know what is meant by 'international standards') or if they lack the knowledge to make a meaningful comparison. Finally, item TQ6 (Table 5.14) specifically mentions high quality and safe meals. Thus, by choosing to respond negatively, teachers may feel they are saying "my school would serve low quality, unsafe meals to students". Moreover, both TQ5 and TQ6 may also be said to draw on notions of loyalty: loyalty to country and loyalty to an organization, and this may also have influenced responses.

7.8 The personal context

7.8.1 Parents and the nutrition environment of the home

Within the personal context, in addition to all the other contexts above which help to shape these choices, a wide range of factors influence children's food choices. At the primary school age, children's experience of eating at home and their parents are likely to be one of the major influences.

As Vaughn et al. (2013) note in their review of literature on parent food practices:

> The home environment has significant influence on child socialization, including adoption of eating behaviours. This is particularly true of younger children (2-12 years old) given their limited autonomy and dependence on adult caretakers who influence dietary intake and eating behaviours through the foods they provide as well as the social environment they create.

Responses from the parents surveyed provide insights into the nutritional environment of the home. Two-thirds of respondents stated that their primary school-age children ate breakfast before school (Table 5.5), a result that is in line with findings which indicate that 72% of primary students eat breakfast regularly, although this habit decreases significant in their older counterparts (Farghaly et al., 2007). For those who do eat, the most popular breakfast items cited suggest this offers them a fairly substantial start to the day (Figures 5.3 and 5.4). In the case of those parents who said their children skipped breakfast, the most frequently cited responses were children not feeling like eating; time pressure or skipping breakfast themselves. For reasons yet to be fully determined, breakfast skipping has been correlated with obesity in young people in numerous studies in different cultural contexts (Rampersaud et al., 2005; Croezen et al., 2009; Hanley et al., 2000; Bin Zaal et al., 2008) including

KSA (Abalkhail and Shawky, 2002; Ministry of Education, 2004; Amin et al., 2008). Farghaly et al. (2007) recommended the introduction of a subsidized school breakfast programme as one of a range of measures to combat childhood obesity in KSA.

Given that a third of children were reported to skip breakfast, it is also important to consider what children eat at home when they return from school. Over four-fifths of the parents surveyed said their children were provided with a home-cooked lunch four times or more a week (Table 5.5). The fact that many Saudis can afford to pay for help in the home may go some way towards explaining this high figure but there are no comparative studies. Responses regarding fruit and vegetable consumption are similar to previous studies that noted the low rates of consumption amongst Saudis (Almarghalani and Stewart, 2013), with over 80% of respondents putting their children's consumption at less than the recommended five a day; over half put this as low as one or two portions. Given that fruit featured fairly frequently as a breakfast item according to parents' responses, this could indicate a very low intake of vegetables. This may also explain parents' overwhelmingly support for restricting the type of snacks sold at school to fruit portions only (Table 5.8) as this might be an easy way of increasing children's daily intake.

7.8.2 Parental responsibilities and food

It is important to recognise that the parents who volunteered to participate in the focus groups were, by definition, particularly interested in their children's nutrition and in that respect they cannot necessarily be considered to be representative or 'typical' of Saudi parents in terms of their attitudes towards their children's diet and their levels of knowledge about nutrition. It became apparent from the focus group that as a result of the King Abdullah Scholarship Programme (see section 6.5.4) some Saudi parents have had experience of different school food systems in a range of developed countries. This has allowed them to make more informed comparisons with what they have seen or heard about elsewhere (for example, Breakfast Clubs, child-friendly menus, and well equipped facilities).

Discussion with focus group participants also provided revealing insights into how these individuals viewed their parental responsibilities with respect to their children's nutrition. The points that they raised can be compared with the results

from the larger sample of participants who were surveyed and help to shed light on these findings. Comments made by the focus group participants in this study suggested that, as parents, they appeared to be conscious of being role models for their children with respect to diet. They occasionally voiced their concerns about what they judged to be their failures in playing that role.Mothers in particular viewed themselves and were also viewed by others as playing a key role in food choices and in family nutrition. They spoke about feeling responsible for trying to enforce good eating habits, both within the home and in the school environment. The most recent literature review of childhood obesity in KSA noted the critical role that mothers play “in their child’s adoption of dietary and physical activity patterns on a daily basis” (Hammad and Berry, 2016: 8). It also highlighted the lack of studies in the Saudi context exploring whether mothers are able to identify children with a weight issue or if they perceive childhood obesity as a matter of concern.

Although it was rarely voiced openly, underpinning the parent focus group discussions there was a recognition that inevitably they had to reach a compromise between what they considered to be the ideal nutritional scenario and the reality of the demands of everyday life. They acknowledged that it would be better

- to have a family breakfast but time pressure and tired children meant that this was simply not feasible;
- for children to take in homemade food to school but they found it easier to give in to their pleas/demands to be allowed to buy snacks from the school canteen;
- if the school served healthy meals but at the same time they were concerned that freshly prepared food would cost more. This highlights the importance of financial concerns.

A similar type of dilemma may be reflected in the fact that parents strongly supported a move to only provide fruit at the school canteen but far fewer provided this for their child to take to school due to their fears about peer pressure.

With regard to knowledge about nutrition, parents in the focus groups clearly took an active interest in learning more about healthy eating, in addition to informing themselves about food safety and hygiene issues. They identified a

range of sources from which they obtained their information including television, the internet, magazines and, most frequently, social media. In this respect, they can be said to be representative of the new Saudi society in which social media have become a key aspect of knowledge-sharing and this may point to the potential that this medium has for conveying information to parents about healthy eating (see section 2.2.2) However, comments made by head teachers, school canteen inspectors and teachers suggest that not all the parents they deal with appear to take their responsibility with regard to their children's nutrition seriously, whatever the reason for this may be. Interviewees highlighted examples of students bringing in food or drinks from home that represented poor nutritional choices for young children. This may be the result of the fact that generally "nutritional knowledge is poor among Saudis, with folklore and media being the main source" (Abualhamail et al., 2016: online).

Given the important role played by parents in the nutrition environment of the home, there is evidence that their involvement in school-based interventions designed to encourage healthy lifestyle behaviours in children is essential (Nixon et al, 2012; Pocock et al, 2010). This is most effective when it uses methods that directly engage parents in activities (Hingle et al., 2010). In her intervention with Lebanese families, Habib-Mourad (2013) arranged meetings for parents which included breakfast, offering guidance on the importance of healthy eating and physical activities. Children also took home information for parents who were unable or unwilling to attend. She found that the most successful strategy for engaging parents directly involved inviting them to participate in school-based activities presented by their children as they usually came to please them.

7.8.3 Food choices in the home and at school

Although all of the parents and other stakeholders showed that they were aware of what was on offer in the school canteen, only two of the parents in the focus groups commented in passing on the lack of variety in the food offered to children. None of the participants raised the fact that because children's food choices are limited or sometimes non-existent, students do not have any chance to opt for a healthier alternative even if they wanted to do so. Children are clearly not being encouraged to experiment with a broader range of foods which may have a longer term negative impact on their diet and ultimately their

future health. This lack of concern about variety and choice may possibly suggest that adult participants themselves eat a fairly limited range of foodstuffs and/or that they lack knowledge about nutrition.

According to Harris (2008), children's willingness to experiment with and accept new food is shaped initially by parents and later by broader cultural influences. If children are not exposed to a range of food tastes and textures at an early age, their levels of food acceptance can be negatively affected (Martins, 2006), leading to what Wardle *et al.* (2005) refer to as food neophobia. This avoidance of new foods can impact negatively on children's consumption of fruit and vegetables and may be detrimental to their physical development and long-term health. In short, research suggests that it can be difficult to change eating habits that have been formed in the early years, and that this is particularly true in the case of poor dietary habits (Douglas, 1998). This highlights the important role that school canteen food may play in the diet of Saudi children.

Evidence that food neophobia may be a particular concern in the Saudi context is suggested by the results of a large-scale lifestyle study conducted by the Ministry of Education in 2004 that focused on Saudi teenagers. It was found that the diet of both adolescent girls and boys showed a marked lack of variety and was often overly dependent on a single type of food. Studies showing low intake of fruit and vegetables in both Saudi teenagers and adults (Ministry of Education, 2004; Almarghalani and Stewart, 2013; El Bcheraoui *et al.* 2015) point to the fact that Saudi schools may therefore have an important role to play in educating children about the need for variety in their daily diet and in encouraging them to try new foods and healthier alternatives as this may not form part of their nutritional environment at home.

DeCosta et al.'s (2017) review of experimental research on changing children's eating behaviour noted that research concerning how the range of food choices available impacts on young children is limited and the results are inconclusive but suggests that the effectiveness of choice-related strategies is closely linked to the social context in which the food is offered. However, the authors do observe that: "Children's eating behaviour is fundamentally governed by what foods are available and accessible to them, and the food made available to them, intentionally or unintentionally, will affect what they eat" (DeCosta et al., 2017:349).

Research conducted in the UK context suggests that it may actually be better to restrict students' food choices in the school environment so that they have to select something healthy (see also section 7.7.2 in this discussion). Ensaff et al. (2013) found that although the menu cycle served by schools may theoretically conform to the required food- and nutrient-based standards (Department of Education and Employment, 2007; 2008), in practice students in the sample tended to avoid the more nutritionally valuable 'dish of the day' option. Instead they preferred to select less healthy 'grab-and-go' alternatives (such as pizza and sandwiches) and dessert. These results supported previous findings that even when children and adolescents have a good understanding of what constitutes a healthy and nutritious diet, they still tend to make poor food choices in the school environment (Gould et al., 2006; Martin et al., 2010; Fitzgerald et al., 2010). This is due to a range of reasons including personal preference, taste, convenience of fast-food snacks, sociocultural factors and peer pressure (Noble et al., 2003; Ludvigsen and Sharma, 2004; Fitzgerald et al., 2010; Golley et al., 2011).

DeCosta et al. (2017) concluded that there was evidence that a number of strategies might encourage increased uptake of fruit/vegetables in the school environment and that these may also be applicable more generally to promoting healthier food choices amongst schoolchildren. These strategies included

- Making a variety of fruit and vegetables both *available* (i.e. offered as a choice in the children's immediate environment) and *accessible* (i.e. prepared and served in a style that facilitates their consumption and makes them appealing to children's palate)
- Employing choice architecture (i.e. consciously altering the design of the eating context) and nudging (i.e. using choice architecture to positively influence food choices) to encourage children to make healthier food choices without restricting or eliminating their choices of less healthy options in school settings
- Presenting healthy choices in appealing packaging featuring age-appropriate well-liked characters as this may be more influential on younger children's food preferences than branding.

Ensaff et al. (2013) also note that "In the ultimate pursuit to improve school food, another way forward is to […] introduce a pricing policy in favour of

healthier options" thus incentivizing the purchase of particular foods or food combinations. All of these strategies could be tried within the Saudi context.

7.9 Barriers and enablers to implementing healthier school food provision in KSA

This discussion, based on synthesising the results from this study with existing research regarding young schoolchildren and the factors that influence their nutritional health in the school food context, has identified a number of barriers that are currently preventing implementation of healthier school food provision in KSA together with factors that would potentially facilitate this (Figure 7.1). Some of these problems and solutions are internal to the school itself and its stakeholders and ultimately would require action at school level. Others relate to broader external issues and would require action at a governmental level to impact on school food provision. These were used to help formulate the recommendations for policy and practice which follow in Chapter Eight.

Figure 7.4 Barriers and enablers of implementation of healthier school food provision in KSA

Current barriers preventing implementation of healthier school food provision in KSA	Factors that would facilitate implementation of healthier school food provision in KSA
Internal to school	**Internal to school**
• Peer pressure • Type of food being sold • Inadequate school premises/facilities • Prevailing teacher/parent attitudes	• Greater parental engagement • Involvement of teachers • Using social media to raise awareness about nutrition/food hygiene issues • Employment of specialist staff/school food champion • Whole-school approach (e.g. creating curriculum links to health and nutrition, PE)
External to school	**External to school**
• Lack of accountability/ transparency within school canteen system • Financial model imposed by Ministry is driving school canteen system • Shifting societal trends in KSA	• Connectedness (e.g. joined up policies/strategic thinking across ministries to tackle crisis in childhood obesity in KSA) • New financial model

The questionnaire results and focus group discussions showed that both parents and teachers believed school food provision had a positive role to play

in raising nutritional standards and helping to establish a healthy diet for school children in KSA. This is encouraging in relation to the implementation of healthier school food provision. According to the guidelines published by the National Governors' Association (2007:3-4) "to really instil the ethos of healthier eating it is vital that it is seen as something the school wants to do, rather than something that is being done to it". This points to the importance of seeing teachers, parents, students, suppliers and the wider community as all having a role to play as stakeholders in ensuring the health of future generations. It also highlights the fact that careful thought would need to be given to how this would be done in the Saudi educational context where the power structure has traditionally been one of top-down power and of rigid hierarchical structures.

7.10 Limitations of this research

For a number of reasons it was not possible to involve primary school-age children directly in this study although this topic is clearly of direct importance to them. However, it was possible to obtain some valuable insights into issues that are likely to impact on them as users of the existing system by means of the concerns voiced by parents, teachers and policymakers. Although involving children in research on school food provision poses a number of challenges, this study would have benefitted from being able to include their voices and perspectives in a more direct way.

This study was conducted in the urban setting of Medina, one of KSA's largest cities, largely because their inhabitants now make up a large percentage of the Kingdom's population. It also draws heavily on the opinions and perspectives of self-selected participants, who are not necessarily representative of the diversity of Saudi society. However, since there is evidence that some of the children most likely to be at risk of developing childhood obesity come from urban areas, in reasonably affluent families and have educated parents (Alam, 2008; Amin et al., 2008; Al-Saeed et al., 2007; Khalid, 2008; Al Alwan et al.; 2013), many elements of the findings from the focus groups can be generalised. However, it is acknowledged that the voices and opinions of those who live in rural communities or form part of KSA's less advantaged citizens population are still be heard on the topic of children's nutrition and school food provision.

In addition, a number of pragmatic compromises had to be built into the research design. For example, firstly, the researcher had to rely on someone

from the local authority to choose the participating primary schools where the questionnaire was to be distributed and had no control over this. It is possible that the local authority contact might have chosen schools that it was believed would be more likely to provide favourable results. Moreover it is not possible to know whether their intake is representative of other schools in the region. However, this was the only way to gain access to the required sample. Furthermore, as noted above, a number of the questionnaire items may have contained unintentional biases in their wording which predisposed respondents to answer in particular ways.

There is an inherent difficulty in attempting to capture data on a topic like children's eating which has the potential to be sensitive, particularly in the context of the current childhood obesity epidemic in KSA. Although no reference was made to this public health concern in the questionnaire, it is possible that the results of some of the responses represent what parents' thought was the 'right' answer rather than reflecting the reality of their children's diet or their true feelings on a topic. In addition, self-censorship may have been operating in some instances in responses. All of these factors made it difficult to interpret what at times seemed contradictory results.

However given that to date all of the research in the Saudi context on children's diet has been of a quantitative nature and has not focused specifically on the nutrition environment of the school setting, this study still makes an innovative contribution to this vitally important area.

8 Chapter Eight: Conclusion

8.1 Introduction

The final chapter of this thesis briefly summarises the findings from this research by reviewing the research questions which were to be addressed in this study. This is followed by recommendations for policy and practice in school food provision in KSA based on the implications of these findings. The chapter also provides an update on recent changes that have taken place in KSA and assesses their potential impact. The focus then shifts to a discussion of some future directions for research in this field and concludes by highlighting the contribution of this study.

8.2 Reviewing the research questions

This study addressed four research questions. Firstly, with respect to the role that school food provision currently play in the nutrition environment of 6-12 year-olds in KSA, the socio-ecological model of KSA's nutrition contexts (Figure 7.2) maps the multiple influences which can potentially impact on the food behaviours of 6-12 year-olds in the school environment. It clearly shows that improving school food provision in KSA means not only considering the nutritional quality of the food on offer but also understanding how school food provision relates to the broader socio-cultural, economic, regulatory and legislative context in KSA.

Secondly, with regard to the current system of school food provision offered in state primary schools in KSA, questionnaire responses and analysis of focus group data showed that parents and teachers thought that there were numerous weaknesses with the current system of school food provision and provided insights into what they perceived to be some of the main shortcomings of this. In addition, they identified key figures who could act as agents of change within the school nutrition environment.

Thirdly, results of the questionnaire showed high levels of support for changing numerous aspects of the current school canteen system but also suggested that family finances, school facilities and funding models merited careful consideration when designing new SFP to ensure that there was no repetition of previous failed attempts to improve children's health using the school nutritional environment.

Finally, analysis of the questionnaire results and of the focus group data also identified the range of factors that are likely to facilitate or hinder implementation of policies related to healthier school food provision in KSA (Figure 7.3) and the implications of these findings helped to shape the recommendations for policy and practice provided in the following section.

8.3 Recommendations

Two sets of recommendations are provided here. The first relate to policy and are based on the WHO World Food Programme (2013: 556-57) recommendations for establishing successful programmes for school food provision derived from international case studies and have been adapted to the context of KSA. The second are more school-focused in nature and provides guidelines for ensuring the success of a school food provision in the Saudi context.

8.3.1 Policy recommendations

Before enacting any policy intended to make major changes to existing school food provision in the state primary sector intended to offer healthier food choices for 6-12 year olds, the Saudi government and relevant ministries should:

1. **Assess existing institutional capacity to enact this change and then plan accordingly to ensure this is adequate:** A school meals programme that is fit for purpose requires adequate resources (human physical and infrastructural) and funding (possibly including a subsidy), professional expertise, and a systematic approach. If any element of this is missing or insufficient, the programme is likely to fail.
2. **Establish clear national minimum standards covering nutrition, food safety and hygiene:** Without these standards, it is not possible to ensure that children have access to food that nutritious and prepared in a manner that is hygienically sound and guarantees it is safe to eat. These standards must also be made clear to all those who could be affected by them i.e. stakeholders such as children, parental, teachers.
3. **Ensure these are monitored and enforced and that the system for doing this are transparent and that those involved in it are accountable:** Without appropriate monitoring and enforcement of

regulations relating to standards these serve no purpose. As with standards, stakeholders must know what they are entitled to expect and how to complain when standards are not met or systems fail.

4. **Attempt to engage in joined-up thinking:** Ensuring healthy school food provision is likely to require coordination and cooperation among several ministries and departments, for example, education, health, agriculture, and public health, and also across several levels including national, regional and municipal. There need to be mechanisms for sharing information, planning and making decisions. A committee without adequate representation from someone with key expertise (for example, a school canteen committee without any expert in child nutrition) cannot fulfil its functions.

8.3.2 Guidelines for a successful school food programme

A school food programme will have more chance of success of enabling children to made healthier food choices

1. If it forms part of a whole-school approach to healthy living that integrates promotion of healthy eating and awareness of nutrition into the school curriculum together with physical activity and healthy lifestyle advice.
2. If the supplier of school food provides quality food with high nutritional value that is child friendly and culturally appropriate.
3. If children's families are informed about the benefits of healthier eating and encouraged to engage directly in school activities relating to the adoption of a healthier lifestyle. In the Saudi context, social media might feature as a useful supplementary aspect of this engagement.
4. If teacher cooperation is guaranteed as a minimum and ideally if participation is more active.
5. If specialist staff with the necessary expertise and enthusiasm are employed to raise levels of awareness concerning healthy eating and principles of nutrition among children, teachers, parents and suppliers.

6. If careful thought is given to countering negative peer pressure and to ways in which this may be harnessed positively as part of interventions/initiatives

In short, in order to impact positively on the current childhood obesity epidemic in KSA, a school food programme needs to be embedded within a much bigger strategy, a whole school approach that not only improves food quality and facilities but also creates curriculum links to health, nutrition and physical activity, and engages stakeholders.

8.4 Changing scenarios

Since this research began, four changes have occurred which are likely to impact on the nutrition environment of school food provision in KSA, although it is difficult to estimate whether overall this impact will be positive or negative.

The first of these, as noted previously, is the massive reduction in the world price of crude oil which has led to major changes in the Saudi economy due to its dependence on this commodity. These changes have begun to impact negatively on the national budget and public sector spending (Dastgir, 2016). It is possible that cuts in Ministry funding to public education will encourage head teachers to maximise the benefits they can obtain from the school canteen by charging higher rents to suppliers. This, in turn, may lead them to buy poorer quality food to maintain their profit margins, impacting on the school nutrition environment. More vulnerable families, particularly those of migrant labourers, are also likely to be forced to reduce their spending on food, producing less healthy nutrition environments for children at home.

On the positive side, the government has also made two announcements that may mark a change in policy direction. The first of these is that all staff who currently work in the Department of School Health under the aegis of the Ministry of Education are to be transferred to the Ministry of Health for the start of the new school year 2017/2018 (*Al-Riyadh,* 2017). Two of the duties that are specifically mentioned as transferring to the control of the Ministry of Health are oversight of school canteens and considering bids submitted for the operation of school canteens. It is still unclear what this will mean in practice for the inspection process and to what extent this will impact on the quality of the food served in the school canteen but given the problems identified in this research

regarding this area, this appears to be a positive step. The shift in ministerial control may also result in changes to the nature of the problematic link that currently exists between school finances and the school canteen. This planned restructuring can also be seen as a broader recognition of the key role that school food plays in Saudi children's health and wellbeing.

The second announcement is that as part of *Saudi Vision 2030* goals to encourage physical activity and an active lifestyle, with effect from the start of the academic year 2017/2018, physical education will, for the first time, form part of the national curriculum for girls at state schools (Ministry of Health, 2017). It remains to be seen how quickly the government's proposal can be translated into reality at school level given the practical problems of limited space and lack of facilities that face all schools together with possible opposition from Saudi conservatives on religious and cultural grounds as noted earlier (section 3.6.1). However both these announcements will hopefully go some way to addressing some of the issues raised by researchers as contributing to the growing childhood obesity crisis in KSA.

In summer 2017, a further announcement relating to an extension to school hours was issued by the Ministry of Education, meaning that the school day will now begin at 7.00am and finish at 3.00pm for all primary school pupils. This lengthening of the school day makes it all the more imperative that adequate school food provision rather than the current form of school canteen snacks is made available to children. At the time of writing, no plans had been announced to make changes to the current system of school food provision as a result of the longer school day.

8.5 Future directions of research

Locating studies on school meals was both challenging and endlessly fascinating due to the fact that this topic has proved to be of interest to researchers across a wide range of disciplines including food studies, nutritional science, geography, sociology, agronomy, history, cultural studies, and environmental studies to name but a few. This suggests that there may be a need to develop a distinctive interdisciplinary approach when studying issues such as childhood obesity which does not currently exist in the Saudi context and is waiting to be developed.

As previously noted, one of the key missing elements from this study was the voice of children although it was clear from what parents said that they can be very much active agents in influencing food choices. No research to date in the Saudi context has attempted to gain insights into the range of meanings that food has for children and adolescents in the way that Ludvigsen and Sharma (2004) explored this concept. However, without this perspective, it will be very difficult to understand the strategies that might work best when attempting to influence the food choices of this group in a healthier direction. This points to the need to find ways of exploring this stakeholder perspective on school food provision.

Focus groups revealed the extent to which Saudi parents and teachers are using social media not only to improve their awareness of nutrition-related issues but also to share concerns with others. In addition, there is growing anecdotal evidence that Saudis are now also using social media to bypass the gatekeepers in conventional institutional hierarchies and to access and lobby ministers and even the monarch himself on issues about which they feel strongly with some success. Some research has already been conducted on how influential figures on Twitter can be used for health promotion (Alabalawi and Sixsmith, 2015) and this would be a promising area to explore in the context of children's nutrition.

As previously noted, for reasons that are still not entirely clear breakfast skipping has been correlated with obesity in children in numerous studies (Abalkhail and Shawky, 2002; Ministry of Education, 2004; Farghaly et al., 2007; Amin et al., 2008). This would be a potentially interesting area for future school-based interventions to target, drawing on the experience of breakfast clubs in the UK.

8.6 The contribution of this research

While this is not the first study to highlight the need to examine the links between school food provision and the current childhood obesity epidemic in KSA, it is the first to use a socio-ecological approach in an attempt to understand the nature of the role that school food provision plays in the diet of 6-12 year-olds. Using this approach has revealed the complexity of the interconnecting influences that underpin the food choices made by children. It is hoped that this will alert decision-makers to the vital importance of adopting a

more holistic approach when devising policies or interventions aimed at improving the nutritional health of children.

This study has also demonstrated the strengths of employing a mixed-method approach to research the topic of school food provision, illustrating how this can be used to provide a voice to key stakeholders in the nutrition environment of the Saudi state primary school. No Saudi studies to date have explored this area. However, supplementing quantitative survey results with qualitative data gathered from parent and teacher focus groups has provided valuable insights into stakeholder perceptions of and attitudes towards current school food provision. It has also shed light on how children's relationships with parents, teachers and their peers may help to shape and influence their food choices and behaviours.

This study has therefore made a valuable and innovative contribution to the field in several respects. Firstly, it provides a useful country-specific case study for researchers interested in potential links between school food provision and childhood obesity. Secondly, its socio-ecological model of nutritional contexts will also be of particular interest to public health researchers and policy-makers in other Arab societies currently undergoing a nutrition transition. Finally, it has broken new ground in the Saudi context by demonstrating the positive benefits of using the mixed-method approach to explore multiple stakeholder perspectives on this aspect of children's nutritional health.

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10 Appendices

Appendix A: KSA School Canteen Regulations (English translation)

SCHOOL CANTEEN REGULATIONS
FOR
BOYS AND GIRLS SCHOOLS
UNDER THE MINISTRY OF EDUCATION
KINGDOM OF SAUDI ARABIA
11/4/2012

In the name of Allah, the Most Merciful, the Most Compassionate

1- INTRODUCTION

Healthy nutrition is considered an essential factor for community health development. Healthy and balanced nutrition provides the body with the essential nutrients needed for the physical and mental growth of youngsters and adults alike. The importance of healthy and balanced nutrition becomes more critical when the targeted group are the student community. Research has shown that nutrition has a great impact on students' academic performance while malnutrition leads to a steady decrease in students' learning ability. Despite the high economic and social living standards in the Kingdom of Saudi Arabia and the availability of all types of food, health indications of student nutrition are greatly related with the patterns of nutrition followed by students such as skipping breakfast and overconsumption of junk foods.

Therefore the Ministry of Education's canteen regulations herein discussed take into account the importance of improving all aspects of school canteens while focusing on boosting nutritional health education by making use of all known educational channels along with the good preparation of health educators by development programmes conducted in the field of school health. In view of the above, the school canteen, in addition to its contribution to nutrition, represents an opportunity to develop the cognitive and behavioural aspects of nutrition in the school community. As thus, we took into consideration the following key points while preparing the canteen regulations for public schools:

1- A review of good practice and previous experience in the field of school canteens greatly contributed to setting the general objectives for school canteens and formulating guidelines and checklists.
2- An emphasis on the fact that the principal objective of managing and establishing the school canteens is to consolidate the students' concept of healthy nutrition as well as to provide them with useful foods at an affordable price.
3- The special nature of the student group for which canteens provide catering suited to their nutritional and physiological needs.
4- Ensuring that those in charge of operating the school canteens are clearly aware of sound health concepts with respect to the critical role played by the school canteen in forming students' ideas about nutrition and the impact of the canteen on students' health levels.
5- The changing nutritional patterns of students as a result of an urban lifestyle and economic growth. This change may not always be positive

as it is marked by an increasing demand for junk foods containing harmful additives.

6- Ensuring that the proposed scientifically based regulations are applicable, flexible and adjustable according to each school's conditions with respect to: the school premises and its location as well as the student population.

2- CONTROL AND SUPERVISION OF SCHOOL CANTEENS

First: Ministry of Education.

Second: Department of Education: The School Canteen Committee, formed at the level of the Department of Education, shall be responsible for school canteens in all Department of Education schools. The Committee shall meet on a regular basis or extraordinarily if there are any developments regarding school canteens.

This committee shall consist of: a representative from School Health Department and Student Activities and nutritional expert (if any), and other experts as determined by the Department of Education.

Duties of the Committee:

1- To take part in preparing the terms and conditions of the canteens operation contract if no standard contract exists and to follow up the contract implementation.

2- In the event a standard contract exists, the committee shall supervise the conclusion of contracts and ensure the compliance thereof with health requirements.

3- To supervise the departments in charge of the school canteens and their departmental activities

4- To coordinate with the relevant authorities at the Department of Education in the event of any violations and to determine the proper penal and corrective measures in coordination with the relevant sections at the Department.

5- To study the termly report issued by the School Health Department and the health units and to take the appropriate measures in view of the report recommendations.

6- To carry out field visits to food processing plants and sites engaged in preparing foods outside the school canteen in order to ensure that the samples of such foods meet the health requirements and that these plants and sites have the regulatory licenses from the municipal authorities and are compatible with the health requirements.

Third: School health departments and health units:

1- Periodical Visits: The officials at the School Health Department shall carry out field visits to the school canteens to make sure that all the health requirements are met. During such visits, the health officials shall:

A- Fill in the school canteen form (attached). If a school visit is not possible, the school manager shall fill in the form at the request of the health unit and send the same to the health unit.

B- Fill in the school canteen's record form and keep it with the school manager.

2- **Emergency Visits:** In the event of any emergency related to the school canteen, an official from the School Health Department (the health unit) shall be assigned to visit the school.
3- **Preparation of a Detailed Report:** The School Health Department shall at the end of each semester prepare a detailed termly report in accordance with the accumulative school canteens form (see attached). The original of this report shall be submitted to the School Canteen Committee at the Department of Education and a copy thereof shall be submitted to the General Department of School Health.

Fourth: School Level:

1- The school manager or his representative shall on a daily basis follow up the implementation of health requirements at school canteens and shall be responsible for reporting any violations to the School Health Unit.
2- To fill in the form of health requirements for school canteens if the School Health Inspector did not pay a visit to the school.
3- To accompany the School Health physician during his/her visit to the school canteen and facilitate his work.
4- To report any violations to the School Canteens Committee at the Department of Education.

3- SPECIFICATIONS OF THE SCHOOL CANTEEN

First: Location and Building:

1- The location allocated for the canteen shall be inside the school campus and in a safe and easily accessible place near the school yard and far away from the toilets. In addition, it should be located in an area not exposed to contamination and near a large hall or a shaded area in the school yard or playground. Safety factors shall be in place in canteen's design and facilities.
2- The area of the canteen and the number of distribution windows thereof must be sufficient to the student population and must not be less than five windows at large schools. At least one seller shall be designated for each one hundred students. Also, the height of the sale windows must be appropriate for each school stage.
3- The ceiling shall be designed in a way that prevents the accumulation of dirt or hiding of insects and pests and shall be easily cleanable.
4- The walls shall be painted with oil paints and preferably white in color. The walls should be smooth and easily cleanable. The areas of food preparation and washing and the places where steam and evaporating oils as well as hand washing areas shall have their walls tiled with light-colored ceramics with a reasonable height.
5- Floor tiles shall be made of water-proof and non-absorbent materials that are easily cleanable and non-slippery. Such materials shall also be resistant to industrial detergents and acids used in the cleaning process and their surfaces shall be flat with no cracks or holes therein and fitted with adequate water drains.
6- The canteen shall be equipped with adequate lightening and ventilation facilities. There should be fans for ventilation and outlets for steam and hot air as well as air conditioning so that the temperature inside the canteen shall not exceed 25 degrees. The canteen shall also be equipped with insect electrocution equipment and fire extinguishers.

7- The doors and windows shall be properly locked and fitted with mesh wires to prevent the entry of insects or rodents.
8- The canteens must be equipped with garbage containers that should be emptied on daily basis and shall be placed in multiple locations inside the canteen. Large plastic garbage bags must be used for collecting the waste.
9- The canteen must have an adequate and safe source for drinking water and must be equipped with washing sinks and adequate cleaning materials for the personnel to wash their hands.
10- Electrical connections must be safe, secure and adequate for all the electrical appliances in the canteen and shall be connected as per the technical standards.

Second: Facilities and Furnishing:

1. Food preparation tables to be made of easily cleanable materials.
2. Adequate refrigerators in good working condition.
3. Closets and shelves for storing foodstuffs that do not require refrigeration must be at least 30 cm high from the ground level.
4. Safety and security equipment such as fire extinguishers to be provided.
5. Food heating equipment such as microwave cookers and electric boilers to be provided.
6. Wrapping and packaging items such as cling film and aluminium foil to be available.
7. All utensils should preferably be of stainless steel and disposable plastic spoons, forks and knives must be used.
8. Insecticides, disinfectants, detergents and cleaning tools must be kept away from food storage areas.
9. Insect electrocution systems and fire extinguishers must be provided.

Third: Instructions for Canteen Operation:

1. The canteen and all its contents must be cleaned daily and as required. Only disposable kitchen roll may be used in cleaning.
2. Disinfectants are to be used for killing bacteria and must be stored away from food items.
3. Water from wall-mounted water heaters must not be used for preparing hot drinks or food.
4. Vegetables and fruits must be washed with clean water before use.
5. Tinned food items must be edible and consumed before the expiry date.
6. All food items must be stored in accordance to the manufacturers' instructions as shown on the food items.

4- Food and Beverages Served at School Canteens

- The school canteen is of great value as long as it provides the balanced nutrition needed by students during this formative growth stage. Therefore, the School Health Unit has carefully chosen the appropriate and healthy foodstuff for this age group.

First: Food items permitted in the school canteen:

- Packs of liquid machine-packed milk, including fresh milk, full- or low-fat homogenised milk, flavored milk or iron-fortified milk.
- Biscuits and cakes made of wholewheat or normal flour (salted or unsalted) or containing dates, sesame seeds or figs provided that these

products are machine packed. The biscuits shall preferably be fortified with iron, vitamins and minerals. Food items containing artificial sweeteners and coloring agents are not permitted.

- Dates that are completely machine-packed, destoned, peeled, washed and cleaned in accordance with health standards and which contain no preservatives or genetically modified substances.
- Small packets of machine-packed nuts containing no artificial colorings or preservatives (except in areas with high levels of G6PD).
- Fresh seasonal vegetables and fruits (bananas, apples, oranges, cucumbers, carrots, etc).
- Sandwiches and pastries filled with cheese, soft cheese, oregano, spinach, boiled eggs, jam, honey, date syrup, peanut butter, chickpeas, beans and legumes (except in areas with high levels of G6PD).
- Juices and beverages:
  1- 100% fresh natural juice in non-glass containers without coloring or preservatives.
  2- Canned juice with a nectar percentage not less than 30% provided they are free from coloring.
  3- Hot beverages, especially hot milk.
  4- Small bottled water sold at the market price.

Second: Foodstuff Requirements:

1- Sandwiches and pastries should be prepared under healthy, hygienic conditions on the same day of consumption.
2- Foodstuffs must be transported, stored and distributed in accordance with sound health specifications.
3- Sandwiches and pastries must be cellophane wrapped.
4- Uncooked materials must be kept in the fridge.
5- Foodstuffs must be supplied by well-known, duly licensed and governmentally controlled vendors.
6- Foodstuffs with a use-by date of over one day must be within the first half of the validity period when supplied to the canteen.
7. Foodstuffs and drinks must not be packaged in glass.
8- The sale of stale foods is prohibited (including sandwiches, pastries, and fresh 100% natural juices) and should be disposed of on a daily basis.
9- Compliance with the food standards specifications issued by the Saudi Standards, Metrology and Quality Organisation (SASO).
10- Compliance with food storage and consumption instructions attached.

Third: Foods Prohibited at the school canteen:

1- All sweets as well as chocolate, chewing gum, junk foods, nuts (with low nutritional value) and all kinds of crisps.
2- All soft drinks and energy drinks; students are not allowed to bring in such drinks from elsewhere.
3- Juices and sugar drinks with a nectar content of less than 30%.
4- Meat and liver.
5- Falafel.

5. **Health Requirements for Foodhandlers in the School Canteen**

First- Health Certificates for Staff Working in School Canteens:

- Staff must obtain health certificates from the competent health authorities, indicating that they are free from infectious diseases transmittable through food and that they are not carriers of these germs. These certificates must be clearly displayed in the canteen.

A. Medical Checkups:

1. Clinical examination of the foodhandler (chest; abdomen; skin diseases).
2. Required laboratory tests, include:
   - A- Stool test for parasites.
   - B- Blood test for both typhoid and paratyphoid.
   - C- Stool culture for salmonella, shigella and vibrio cholerae
   - D- Chest X-ray

These examinations and tests must be conducted in health units, primary healthcare centers or hospitals affiliated to the Ministry of Health or in private clinics, dispensaries and hospitals authorized by the Ministry of Health.

B. Immunizations:

1. Immunization against meningitis once every two years.
2. Immunization against typhoid (two doses with intervals of at least one week to be carried out every two years).
3. Any other immunizations required by relevant health authorities.

C. Validity of the Health Certificate:

The certificate is valid for one year and must be renewed on expiry. The above steps must be followed to obtain another certificate and a clinical examination for any skin diseases or other diseases to be conducted again six months after the effective date of the certificate.

Second – Infectious Diseases and Injuries:

A- **Infectious diseases**: Anyone suspected of suffering from any infectious disease or having an infected wound, skin infection, or sore; or diarrhoea shall be prohibited from handling foods or doing any work directly related to food.

B- **Injuries**: If a foodhandler is injured while working in the canteen, s/he shall be immediately excluded from work until the wound is covered using a securely fixed waterproof plaster of a distinctive color and any first aid is administered. A worker is only allowed to return to work when any wounds are completely healed.

Third: Personal Appearance and Behaviour:

All employees must abide by the following:

1. Maintaining a smart appearance with due care for personal hygiene and washing hands with safe antiseptic solutions before entering the premises and particularly after using the toilet.
2. Wearing a clean uniform at work (preferably white) together with disposable headwear, mask and gloves.
3. Never spitting or blowing the nose in the workplace or touching the hair, nose, mouth or ears.
4. Nails must be trimmed and clean.
5. Personal belongings such as jewellery, rings, or watches must not be worn during food preparation or serving.
6. Wash hands carefully before starting work; after each food preparation process; after every break; after eating or touching

any part of the body such as hair, mouth or nose; after sneezing or blowing the nose and after returning to the workplace if it was necessary to leave for any reason.

7. Never eating or drinking inside the canteen.

6. Administrative Instructions for School Canteen Operation

1. If there is no canteen on the school premises, the companies operating canteens shall build a room in the school yard as per the aforementioned specifications on an appropriate site according to the school size as well as the terms and conditions stated in the canteen operation contract.
2. Ensure various canteen-operating companies exist in the same city in order to create a spirit of competition and productivity whenever possible.
3. These requirements shall be included in the contracts of school canteen operators.
4. These regulations shall be applicable to all new contracts and school canteens not included in the operators' contracts.
5. Given the importance of encouraging the consumption of milk and dates due to their nutritional values, they must always be available in all school canteens.
6. School canteen regulations will be updated every three years or as required.

APPENDIX TO REGULATIONS

Inspection Form

For Evaluating the Health Specifications of School Canteens

Department of Education: **Region/Governorate:**

School: **Date:** **Canteen supervisor:**

School Canteen Operating Method :

- ☐ Company
- ☐ School outsourcer
- ☐ School
- ☐ Other (specify).

1. General Requirements for Canteen Premises

No.	Item	Compliant	Non-compliant
1	Canteen location		
2	Far from toilets and sources of contamination		
3	Canteen area must be 20m^2		
4	One sales window per 100 students		
5	Walls must be covered with ceramic tiles or oil-based		

	paint		
6	Floors tiled or painted with oil-based paint		
7	Ventilation		
8	Cupboards and shelving for food storage		
9	Adequate surface water drainage		
10	Tight-fitting doors and windows		
11	Lighting		

2. Canteen Assets

Item	Compliant	Non-Compliant
Pots and utensils used in food preparation		
Refrigeration in the canteen		
Devices for food heating		
Bins and waste containers		
Cooker hoods		
Air conditioning		
Food preparation surface		
Water heaters		
Insect trap or insect-killer device		
Disposable kitchen roll		
Fire extinguishers		
Water source in the canteen		

3. Canteen Staff

No.	Item	Compliant	Non-compliant
1	Valid health certificates		
2	Personal hygiene		
3	Uniform		
4	Use of gloves		
5	Use of headwear		
6	Use of masks		
7	Correct ratio of food sales' assistants to students		

4. Conditions of Food Service

No.	Foodstuffs	Yes	No
1	Are foods freshly prepared?		
2	Are pre-prepared foods machine packed?		
3	Are foods prepared in a healthy way?		
4	Are foods preserved in a healthy way?		
5	Is the canteen committed to serving permitted food only?		
6	Is food prepared within the canteen?		
7	Is food prepared outside the canteen?		
8	Are these foods supplied by an authorized supplier?		
9	Are foods transported in a healthy way?		
10	Are sandwiches wrapped in cellophane?		
11	Are foods packed automatically?		

12	Are there any glass containers?		
13	Is there any stale food?		
14	Is the food well within sell-by date?		
15	Are there any fully packed meals?		

5. Permitted Foods and Beverages

No.	Foods and Beverages	Yes	No
1	Milk		
2	Flavoured milk		
3	Powdered Milk with iron		
4	Machine packed dates		
5	Biscuits/cakes		
6	Wrapped pastry		
7	Plain biscuits		
8	Egg sandwiches		
9	Jam sandwiches		
10	Honey sandwiches		
11	Spinach sandwiches		
12	Cheese sandwiches		
13	*Labneh* (soft cheese) sandwiches		
14	Peanut butter sandwiches		
15	Fresh fruit		
16	Vegetables (e.g. cucumber sticks, carrot sticks)		
17	Bottled water		
18	Tetrapak fruit juices (Natural juice minimum 30% nectar)		
19	Beans		
20	Hummus		
21	Hot drinks (e.g. tea, milk) for secondary students		

6. Prohibited Foods and Beverages

No.	Subject	Yes	No
1	Soft drinks and energy drinks		
2	Beverages/ juices with less than 30% nectar		
3	Sweets of all kinds and chocolate		
4	Crisps and corn snacks of any flavour (sticks or chips)		
5	Foods about to expire		
6	Foods past expiry date		
7	Meat/liver		
8	Falafel		

Appendix B: Letter of permission to conduct research in Medina

المملكة العربية السعودية
وزارة التربية والتعليم
الإدارة العامة للتربية والتعليم بمنطقة المدينة المنورة
إدارة التخطيط والتطوير

بسم الله الرحمن الرحيم

الرقم: ٣٦١٣٦٤٨٧٤
التاريخ: ١١ / ٧ / ١٤٣٦هـ
المشفوعات: ١ سمايلين

الموضوع : تسهيل مهمة الباحثة/ هنادي عبدالحميد إلياس

تعميم إلى جميع المدارس الابتدائية داخل المدينة (بنين ، بنات)

إلى: مدير مدرسة/ وفقه الله

إلى: مديرة مدرسة/ وفقها الله

من : مدير إدارة التخطيط والتطوير

السجل المدني/١٠١١٧٤٧٠٧٦

السلام عليكم ورحمة الله وبركاته .

حيث أن الباحثة/ هنادي عبدالحميد إلياس مبتعثة في برنامج خادم الحرمين الشريفين للأبتعاث الخارجي لمرحلة الدكتوراه في جامعة مانشستر متروبوليتان في المملكة المتحدة، وترغب في تطبيق أداة بحثها بعنوان " ضرورة اعتماد نظام الوجبات الغذائية في المدارس من الفئة ٦- ١٢ في المملكة العربية السعودية " على عينة معلمي ومعلمات المرحلة الابتدائية وأولياء أمور الطلاب والطالبات ، وذلك ضمن متطلبات الحصول على درجة الدكتوراه.

نأمل من سعادتكم تسهيل مهمتها عند **زيارتها لمدارس البنات ولمن ينوب عنها عند زيارته لمدارس البنين** لتطبيق أداة بحثها، ونشكر لكم اهتمامكم بالبحث التربوي الذي يسهم في تطوير العملية التربوية والتعليمية.

وتقبلوا وافر التحية والتقدير.

يعقوب بن يوسف عفيفي

- صورة للباحثة على البريد الإلكتروني w.saeed.12@hotmail.com
- صورة للملف البحوث والدراسات .

هاتف: ٨٣٧٦٥٠٦ فاكس: ٨٣٩٢٥٨٢ البريد الالكتروني: pdplan1@gmail.com

Appendix C: Letter of permission to conduct research in Medina (English translation)

Kingdom of Saudi Arabia
Ministry of Education
General Administration for Education in Medina Region
Department of Development and Planning

Reference No: 361364874
Date: 11/07/1436 H (31/03/ 2015)
Re: Facilitating access for the researcher Hanadi Abdulhamid Elyas
National registry number: 1011747076

Memo to all primary schools (boys and girls) in the Medina Region

To : The school head

Greetings

The researcher Hanadi Abdel Hameed Elyas holds a scholarship under the terms of the program of the Custodian of the Two Holy Mosques for Foreign Scholarship and is registered for a PHD at Manchester Metropolitan University in the UK. The researcher wishes to carry out research with a sample of teachers and parents at the primary stage.

Her research title is “The need for implementing a school meals system in primary schools for 6-12 year-olds in the Kingdom of Saudi Arabia” and forms part of the requirements for obtaining a doctoral degree.

We hope you will facilitate her research to be carried out in girls' schools and also that of her male research assistant in boys’ schools, to allow her to pursue her study.

I thank you in advance for your cooperation in this educational research, which will contribute to the development of educational process.

Yours sincerely

Yacoub Ben Youssef Afifi

Appendix D: Participant Information Sheets for Parents/Teachers (English translation)

PARTICIPANT INFORMATION SHEET (PARENTS)

Dear Participant,

My name is Hanadi Elyas. I am a PhD student at Manchester Metropolitan University in the United Kingdom. I study in the field of food science.

The purpose of my project is to explore the current system of school food provision offered in state primary schools in the Kingdom of Saudi Arabia and to examine a range of opinions on this, including those of parents.

This questionnaire is intended to gather information about the eating habits of your 6-12 year old children at school and at home. I am also interested in your opinions about the current school canteen system and other possible options that could be used for feeding children at school.

I would be grateful if you could take the time to fill in the questionnaire you have received, and then return it to the school in the envelope that was provided. Please return your questionnaire by the date specified on the email that you received.

Any information that you provide in this questionnaire will remain strictly confidential. None of the information that you provide on the questionnaire will be used for any purpose other than this research project. If you would like to ask any questions about this questionnaire or the study, please do not hesitate to contact me at HANADI.A.ELYAS@stu.mmu.ac.uk.

Please read and complete the attached Participant Consent Form before you begin the questionnaire.

Many thanks for your cooperation

Hanadi Elyas

Appendix E: Participant Information Sheets for Parents/Teachers (English translation)

PARTICIPANT INFORMATION SHEET (TEACHERS)

Dear Participant,

My name is Hanadi Elyas. I am a PhD student at Manchester Metropolitan University in the United Kingdom. I study in the field of food science.

The purpose of my project is to explore the current system of school food provision offered in state primary schools in the Kingdom of Saudi Arabia and to examine a range of opinions on this, including those of teachers.

I am interested in your opinions about the current school canteen system and other possible options that could be used for feeding children at school.

I would be grateful if you could take the time to fill in the questionnaire you have received, and then return it to HANADI.A.ELYAS@stu.mmu.ac.uk. Please return your questionnaire by the date specified on the email that you received.

Any information that you provide in this questionnaire will remain strictly confidential. None of the information that you provide on the questionnaire will be used for any purpose other than this research project. If you would like to ask any questions about this questionnaire or the study, please do not hesitate to contact me at HANADI.A.ELYAS@stu.mmu.ac.uk.

Please read and complete the attached Participant Consent Form before you begin the questionnaire.

Many thanks for your cooperation

Hanadi Elyas

Appendix F: Participant Consent Form (English translation)

PARTICIPANT CONSENT FORM

Project title: School meals in KSA

Researcher's name: Hanadi Elyas

- I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me. I understand and agree to take part.
- I understand the purpose of the research project and my involvement in it.
- I understand that I may withdraw from the research project at any stage and that this will not affect my status now or in the future.
- I understand that while information gained during the study may be published, I will not be identified and my personal results will remain confidential.
- I understand that I may contact the researcher if I require further information about the research.

Signed: …….

(Research participant)

Print name: ……..

Date: ……..……

Researcher's contact details:

HANADI.A.ELYAS@stu.mmu.ac.uk

Appendix G: Parents' questionnaire

استبيان لأولياء الأمور

كيفية تعبئة هذا الاستبيان

اقرأ السؤال / الجملة, ثم ضع علامة صح في المربع للإجابة المناسبة.

مثال: التفاح هو فاكهتي المفضلة.

أوافق ☐ موافق ☑ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

إذا كنت ترغب في تغيير رأيك، أشطب أجابتك الأصلية ووضع علامة صح في الخيار الذي ترغب في اختيارها.

مثال: التفاح هو فاكهتي المفضلة.

أوافق ☐ موافق ☑ غير متأكد ☐ غير موافق ☑ أرفض بشدة ☐

تذكر: عند تعبئة هذا الاستبيان يرجى التفكير في جميع الأطفال (الأولاد و البنات) الذين تتراوح أعمارهم بين 6 سنوات إلى 12 سنة في منزلك.

سؤال 1 : هل جميع أطفالك في سن المرحلة الابتدائية ملتحقين بالمدرسة الحكومية؟

نعم ☐ لا ☐

سؤال 2 : هل عادة يأكل أطفالك وجبة الإفطار قبل أن يذهبوا إلى المدرسة؟

نعم ☐ لا ☐

سؤال 3 : أي من هذه الخيارات التالية, تقدم أنت عادة وجبة إفطار لطفلك / أطفالك في اليوم الدراسي؟

ضع علامة صح على جميع الخيارات التي ينطبق عليها ذلك.

كورن فليكس ☐ النقانق ☐ الجبن ☐ عصير فواكه بنكهات ☐ حليب ☐

حليب ☐ الشوفان ☐ التوست ☐ الزبادي ☐ البيض ☐

فواكهة ☐ الشاي ☐ العسل ☐

سؤال 4 : إذا كان أطفالك لا يتناولون وجبة الإفطار قبل المدرسة، فما هي الاسباب ؟ أدرجها أدناه.

-

-

سؤال 5 : هل يشتري أطفالك الطعام من مقصف المدرسة ؟

نعم ☐ لا ☐

سؤال 6 : هل سيرحب أولياء الأمور ببرنامج للوجبات الغذائية الذي يقدم وجبات مطبوخة للتلاميذ كجزء من الجدول المدرسي اليومي.

نعم ☐ لا ☐

سؤال 7 : كم في المتوسط من المال تعتقد أن الطفل يجب أن يمنح من المال لشراء الطعام في المدرسة كل يوم؟

2-4رس 5-9رس 10-12رس

سؤال 8 : من الأفضل اعطاء الأطفال أغذية محلية معدة بالمنزل لتناولها في المدرسة عن ان تمنحهم المال لشراء الطعام من متجر المدرسة؟

نعم ☐ لا ☐

سؤال 9 : هل اعطاء الأطفال أغذية محلية معدة بالمنزل لتناولها في المدرسة أصعب من ان تمنحهم المال لشراء الطعام من مقصف المدرسة؟

نعم ☐ لا ☐

سؤال 10 : لماذا تعتقد أن أولياء الأمور يفضلون إعطاء المال لأطفالهم لشراء الطعام في المدرسة بدال من تقديم الطعام المنزلي؟

-

-

سؤال 11 : ما هو الطعام / المشروبات التي تعطيها لأطفالك في سن المرحلة الابتدائية لأخذها معهم إلى المدرسة؟

الفاكهة ☐ شيبس ☐ عصير ☐ ساندويشات ☐ حليب ☐ فواكه

بسكويت ☐

سؤال 12 : ما هي أنواع الوجبات الخفيفة (الطعام / المشروبات) التي عادة توفرها للأطفال في سن المرحلة الابتدائية من بين الوجبات المعدة منزليا؟؟

الشيبس ☐ الماء ☐ الحليب ☐ فواكه ☐ حليب بنكهات ☐

المعجنات ☐ البسكويت ☐ ساندوتشات ☐ الشاي ☐ أخرى ☐ البرجر

سؤال 13 : كم عدد المرات في الاسبوع التي يتناول فيها أطفالك وجبة طعام الغداء المعدة منزليا ؟

يوم ☐ يومان ☐ 3 أيام ☐ 4 ايام ☐ أكثر من 4 ايام ☐

سؤال 14 : كم عدد قطع الفاكهة والخضروات التي يتناولها أطفالك يوميا ؟

1-2 قطعة ☐ 3-4 قطعة ☐ أكثر من 5 قطع ☐

سؤال 15 : هل ينبغي على المدارس أن تقدم الفواكه كوجبات خفيفة تباع للأطفال؟

نعم ☐ لا ☐

سؤال 16 : ماهو مدى شعورك بالثقةبإنه لك تأثير إيجابي في خيارات اطفالك للطعام عندما يكونون في المدرسة؟

واثق ☐ واثق ☐ واثق إلى ☐ واثق ☐ لاأثق على ☐

تماما جدا حد ما قليلاً الإطلاق

سؤال 17 : بعض الأسر في مجتمعنا تجد صعوبةمن أجل توفير ثمن شراء الطعام من مقصف المدرسة.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 18 : أي من الخيارات التالية سيكون ضمن خياراتك المفضلة؟

☐ الخيار 1: يجب على المدرسة أن تستأجر شركة أغذية لتقديم وبيع وجبات الطعام للأطفال.

☐ الخيار 2: يجب على المدرسة تعيين موظفين مؤهلين لأعداد وجبات غذائية صحية وبيعها للأطفال

سؤال 19 : يرجى ذكر الأسباب في اختيارك للخيار الذي حددته

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سؤال 20 : هل يجب على الحكومة السعودية إعادة توزيع الوجبات الغذائية مجاناً لطلاب المدارس الابتدائي

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 21 : يجب على المدارس بناء مطابخ بحيث يمكنهم توظيف مختصين لإعداد وجبات الطعام للطلاب

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 22 : يجب على وزارة التربية التعليم أن تضع معايير ومواصفات تتعلق بالقيمة الغذائية والنظافة الصحية والسلامة للوجبات الغذائية في المرحلة الابتدائية.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 23 : ينبغي على المدارس الحصول على الموارد المالية والبشرية اللازمة لتنفيذ سياسة جديدة بشأن توفير الغذاء المدرسي لتلاميذ مدارس المرحلة الابتدائية الحكومية.

أوافق بشدة ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 24 :يجب على الحكومة أن تعطي الأولوية لوضع وتنظيم المعايير الغذائية للوجبات الغذائية

أوافق بشدة ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 25 : وزارة التربية و التعليم قادرة على وضع وتنفيذ برنامج وطني للوجبات الغذائية.

أوافق بشدة ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 26 : برنامج الوجبات المدرسية يجب أن يكون جزء من برنامج أوسع يهدف إلى تحسين الصحة والتغذية في كل مدرسة ابتدائية تابعة للحكومة.

أوافق بشدة ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 27 : برنامج الوجبات المدرسية يجب أن يكون له تأثير إيجابي على اتجاهات أطفال المدارس الابتدائية حول الغذاء الصحي.

أوافق بشدة ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 28 : أن برنامج الوجبات المدرسية يحسن صحة الأطفال في سن التعليم الابتدائي في المملكة العربية السعودية.

أوافق بشدة ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

شكرا جزيلا على تعبئة هذا الاستبيان,,,

Appendix H: Parents' questionnaire (English translation)

QUESTIONNAIRE FOR PARENTS

How to fill in this questionnaire

Read the question/statement. Then place a tick in the box by the appropriate response.

Example:

PQx: Apples are my favourite fruit.

Strongly agree	☐	Agree	☑	Not sure	☐	Disagree	☐	Strongly disagree	☐

If you wish to change your mind, cross out your original response and place a tick in the option you wish to choose.

Example:

PQx: Apples are my favourite fruit.

Strongly agree	☐	**Agree**	☑	Not sure	☐	Disagree	☑	Strongly disagree	☐

Remember: When you fill in this questionnaire please think about <u>all</u> the children[41] aged from 6 years to 12 years in your household who attend this school.

PQ1: Do all of your primary school age children attend a state school?

Yes ☐ No ☐

PQ2: Do your children usually eat breakfast before they go to school?

Yes ☐ No ☐

[41] Arabic version specifies the gender of the children (boys/girls, sons/daughters) throughout).

PQ3: Which of these do you typically provide as breakfast for your child/children on a school day? Tick all those which apply.

Cereal	☐	Sausages	☐	Cheese	☐	Fruit Juice	☐
Toast	☐	Porridge	☐	Yogurt	☐	Flavoured Milk	☐
Eggs	☐	Honey	☐	Fruit	☐		
Milk	☐	Tea	☐				

PQ4: If your children do not eat breakfast before school, what are the reasons for this? List them below.

PQ5: Do your children buy food from the school shop?

Yes ☐ No ☐

PQ6: Parents would welcome a school meals programme which provides cooked meals for pupils as part of the daily school schedule.

Strongly agree	☐	Agree	☐	Not sure	☐	Disagree	☐	Strongly disagree	☐

PQ7: On average, how much money do you believe a child should be given to buy food at school each day?

2-4 RS ☐ 5-9 RS ☐ 10-12 RS ☐

PQ8: Providing children with home-made food to be consumed at school is preferable to giving them money for food from the school shop.

Yes ☐ No ☐

PQ9: Providing children with home-made food is more difficult than giving them money for food from the school shop.

Yes ☐ No ☐

PQ10 Why do you think parents prefer to give money to children to buy food at school rather than providing home-made food?

PQ11: What type of food/drinks do you give your children of primary school age to take to school?

Fruit ☐ Fruit Juice ☐

Crisps ☐ Sandwiches ☐

Milk ☐ Biscuits ☐

PQ12: What types of snacks (food/drinks) do you typically provide for your primary school-age children between meals at home?

Crisps ☐ Water ☐ Flavoured Milk ☐

Fruit ☐ Milk ☐ Other ☐

Burger ☐ Biscuits ☐

Pastry ☐ Tea ☐

PQ13: How many times per week do your children have a home-cooked meal for lunch?

1 day ☐ 2 days ☐ 3 days ☐ 4 days ☐ More than 4 days ☐

PQ14: How many portions of fruit and vegetables do your children eat per day?

1-2 portions ☐ 3-4 portions ☐ 5 portions or more ☐

PQ15: Schools should restrict the type of snacks sold to children to fruit portions only.

Yes ☐ No ☐

PQ16: How confident do you feel that you have a positive influence on food choices made by your children when they are in school?

Totally confident ☐ Very Confident ☐ Fairly Confident ☐ A little confident ☐ Not at all confident ☐

PQ17: Some families in our community struggle to afford the cost of buying food from the school shop.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

PQ18: Which of these options would be your preferred choice?

- ❒ Option 1: The school should hire a catering company to source, buy, prepare and serve meals to children.
- ❒ Option 2: The school should employ its own catering staff to source, buy, prepare and serve meals to children

PQ19: Please give your reasons for choosing the option that you selected.

PQ20: The Saudi government should reintroduce the distribution of free meals for primary school students.

Strongly ☐ Agree ☐ Not ☐ Disagree ☐ Strongly ☐

agree sure disagree

PQ21: Schools should build their own kitchens and canteens so that they can employ catering professionals to prepare meals for their students.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

PQ22: The Ministry of Education should establish standards and specifications relating to nutritional value, hygiene and safety of school meals in primary schools.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

PQ23: Schools have the necessary financial and human resources to implement a new policy on provision of school food for state primary school pupils

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

PQ24: The government should prioritise the establishment and regulation of minimum nutritional standards for school meals.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

PQ25: The Ministry of Education would be capable of establishing and implementing a national school meals programme.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

PQ26: The school meals programme should form part of a broader programme intended to improve health and nutrition within every state primary school.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

PQ27: A school meals programme would have a positive impact on primary school children's attitudes to healthy eating.

Strongly agree	☐	Agree	☐	Not sure	☐	Disagree	☐	Strongly disagree	☐

PQ28: A school meals programme would improve the health of primary school age children in KSA.

Strongly agree	☐	Agree	☐	Not sure	☐	Disagree	☐	Strongly disagree	☐

Many thanks for completing this questionnaire.

Appendix I: Teachers' questionnaire

استبيان المعلمين والمعلمات

كيفية تعبئة هذا الاستبيان

اقرأ السؤال / الجملة. ثم ضع علامة صح في المربع من خلال الاجابة المناسبة.

مثال: التفاح هو فاكهتي المفضلة.

أوافق ☐ موافق ☑ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

إذا كنت ترغب في تغيير رأيك، أشطب استجابتك الأصلية ووضع علامة صح في الخيار الذي ترغب في اختيار.

مثال: التفاح هو فاكهتي المفضلة.

أوافق ☐ موافق ☑ غير متأكد ☐ غير موافق ☑ أرفض بشدة ☐

تذكر: عند تعبئة هذا الاستبيان يرجى الأخذ في عين الاعتبار جميع الأطفال (الأولاد و البنات) الذين تتراوح أعمارهم بين 6 سنوات إلى 12 سنة في منزلك.

سؤال 1 : هل انت معلم في مدرسة ابتدائية حكومية في المدينة المنورة؟

نعم ☐ لا ☐

سؤال 2 : كم في المتوسط من المال تعتقد أن الطفل يجب أن يمنح من المال لشراء الطعام في المدرسة يومياً؟

2-4 ر.س 5-9 ر.س 10-12 ر.س

سؤال 3 : بعض الأسر في مجتمعنا تجد صعوبة من أجل توفير ثمن شراء الطعام من مقصف المدرسة.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 4 : يرحب المعلمون ببرنامج لوجبات الغذائية الذي سيقدم وجبات مطبوخة للتلاميذ كجزء من الجدول المدرسي اليومي.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐ بشدة

سؤال 5 : تمتلك المدارس السعودية الموارد اللازمة لتنفيذ برنامج وجبات غذائية متوازنة تلبي المعايير الدولية.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐ بشدة

سؤال 6 : ما هو مدى ثقتك بأن مدرستك سوف تكون قادرة على إعداد وطبخ وتقديم وجبات عالية الجودة وآمنة لطلابك؟

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐ بشدة

سؤال 7 : يجب على المدارس بناء مطابخ بحيث يمكنهم توظيف مختصين لإعداد وجبات الطعام للطلاب.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐ بشدة

سؤال 8 : برنامج الوجبات المدرسية يجب أن يكون جزء من برنامج أوسع يهدف إلى تحسين الصحة والتغذية في كل مدرسة ابتدائية تابعة للحكومة.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐ بشدة

سؤال 9 : يجب أن توفر وزارة الصحة العامة مبادئ توجيهية وطنية بشأن معايير النظافة الغذائية للأغذية المباعة في المدارس.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐ بشدة

سؤال 10 : يجب على الهيئة السعودية للأدوية والأغذية إصدار المواصفات والمعايير المتعلقة بالتغذية التي تستهدف الطلاب الملتحقين بالمدارس.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 11 : تمتلك المدارس الموارد المالية والبشرية اللازمة لتنفيذ سياسة جديدة لتوفير الغذاء المدرسي لتلاميذ المدارس الابتدائية الحكومية.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 12 : يجب على الحكومة السعودية اعادة توزيع وجبات غذائية مجانية لطلاب المدارس الابتدائية.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 13 : ينبغي أن تعطي الحكومة الأولوية لوضع وتنظيم الحد الأدنى من المعايير الغذائية للوجبات الغذائية في المدارس.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 14 : ينبغي أن تضع وزارة التربية و التعليم معايير ومواصفات تتعلق بالقيمة الغذائية والنظافة الصحية وسلامة الوجبات المدرسية في المدارس الابتدائية.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 15 : وزارة التعليم قادرة على وضع وتنفيذ برنامج وطني للوجبات الغذائية في المدارس.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 16 : برنامج الوجبات الغذائية يجب أن يكون له تأثير إيجابي على اتجاهات أطفال المدارس الابتدائيةحول الغذاء الصحي.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 17: أن برنامج الوجبات المدرسية يحسن صحة الأطفال في سن التعليم الابتدائي في المملكة العربية السعودية.

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

سؤال 18 : أي من الخيارات التالية سيكون ضمن خياراتك المفضلة؟

☐ 1: يجب على المدرسة أن تستأجر شركة أغذية لتقديم وبيع وجبات الطعام للأطفال.

☐ 2: يجب على المدرسة تعيين تعيين موظفين مؤهلين لأعداد وجبات غذائية صحية وبيعها للأطفال

سؤال 19 : يرجى ذكر الأسباب في اختيارك للخيار الذي حددته.

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سؤال 20 : هل سيقبل المعلمين التغيير في اليوم الدراسي الناشئ عن تطبيق نظام الوجبات المدرسية

أوافق ☐ موافق ☐ غير متأكد ☐ غير موافق ☐ أرفض بشدة ☐

شكرا جزيلا على تعبئة هذا الاستبيان,,,

Appendix J: Teachers' questionnaire (English translation)

QUESTIONNAIRE FOR TEACHERS

How to fill in this questionnaire

Read the question/statement. Then place a tick in the box by the appropriate response.

Example:

TQx: Apples are my favourite fruit.

Strongly agree ☐ Agree ☑ Not sure ☐ Disagree ☐ Strongly disagree ☐

If you wish to change your mind, cross out your original response and place a tick in the option you wish to choose.

Example:

TQx: Apples are my favourite fruit.

Strongly agree ☐ **Agree** ☑ Not sure ☐ Disagree ☑ Strongly disagree ☐

TQ1: Do you teach at a state primary school in Medina?

Yes ☐ No ☐

TQ2: On average, how much money do you believe a child should be given to buy food at school each day?

2-4 RS ☐ 5-9 RS ☐ 10-12 RS ☐

TQ3: Some families in our community struggle to afford the cost of buying food from the school shop.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

TQ4: Teachers would welcome a school meals programme which provides cooked meals for pupils as part of the daily school schedule.

Strongly agree	☐	Agree	☐	Not sure	☐	Disagree	☐	Strongly disagree	☐

TQ5: Saudi schools have the necessary resources to implement a nutritionally balanced school meals programme that would meet international standards.

Strongly agree	☐	Agree	☐	Not sure	☐	Disagree	☐	Strongly disagree	☐

TQ6: How confident are you that your school would be able to prepare, cook and serve high quality, safe meals for your students?

Totally confident	☐	Very Confident	☐	Fairly Confident	☐	A little confident	☐	Not at all confident	☐

TQ7: Schools should build their own kitchens and canteens so that they can employ catering professionals to prepare meals for their students.

Strongly agree	☐	Agree	☐	Not sure	☐	Disagree	☐	Strongly disagree	☐

TQ8: The school meals programme should form part of a broader programme intended to improve health and nutrition within every state primary school.

Strongly agree	☐	Agree	☐	Not sure	☐	Disagree	☐	Strongly disagree	☐

TQ9: The Ministry of Public Health should provide national guidelines concerning hygiene standards for food sold in schools.

Strongly agree	☐	Agree	☐	Not sure	☐	Disagree	☐	Strongly disagree	☐

TQ10: The Saudi Medicines and Food Authority should issue specifications and standards relating to nutrition aimed at students attending schools.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

TQ11: Schools have the necessary financial and human resources to implement a new policy on provision of school food for state primary school pupils.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

TQ12: The Saudi government should reintroduce the distribution of free meals for primary school students.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

TQ13: The government should prioritise the establishment and regulation of minimum nutritional standards for school meals.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

TQ14: The Ministry of Education should establish standards and specifications relating to nutritional value, hygiene and safety of school meals in primary schools.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

TQ15: The Ministry of Education would be capable of establishing and implementing a national school meals programme.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

TQ16: A school meals programme would have a positive impact on primary school children's attitudes to healthy eating.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

TQ17: A school meals programme would improve the health of primary school age children in KSA.

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

TQ18: Which of these options could be your preferred choice?

- ❒ Option 1: The school should hire a catering company to source, buy, prepare and serve meals to children.
- ❒ Option 2: The school should employ its own catering staff to source, buy, prepare and serve meals to children

TQ19: Please give your reasons for choosing the option that you selected.

TQ20: Teachers would accept change in the school day arising from the introduction of school meals system

Strongly agree ☐ Agree ☐ Not sure ☐ Disagree ☐ Strongly disagree ☐

Many thanks for completing this questionnaire

Appendix K: Extract from transcript of fathers' focus group: First coding

the products that they have for offer on sale at the school canteen. A list of everything. **I'm sure that a lot of the sweets and the food that they sell are not good to give to our children and [OVERLAPS]**

P1M: **All [EMPHASISES] of those sweets they sell in schools are really really bad. They're just full of sugar and ... and nothing else. My wife is always showing me information that has been posted on Twitter or Instagram about the kind of awful rubbish they put in some of those sweets.** But **they all look so bright and colourful they really appeal to little kids** and the worst thing is a child at that age... in fact, **most children don't realize that it's not good, it's not healthy to keep eating just sweets and crisps all the time, every day [...]**

P4M: I think a lot of adults are probably just as bad, too... [HE LAUGHS AND PATS HIS STOMACH]

P1M: Oh yes, I know, my friend [HE LAUGHS AND GESTURES TO HIMSELF] but what I mean is, what I mean is kids... **why would they know any better than eating sweets?** It's the same for everything with kids, isn't it? **Cartoons, video games, they would sit there all day and all night just watching what's on the screen and they just carry on, carry on, carry on until you say "No, No. That's enough. No more. Stop now. It's time to go to bed."** And with the school canteen it's the same but it's even worse because **children are probably... are probably hungry if they didn't have any breakfast at home before they went to school in the morning. I know my kids they won't eat anything, nothing at all early in the morning before school...**

Comment [a51]: solution

Comment [a52]: Nutrition opinion imprecise

Comment [a53]: Nutrition opinion very negative

Comment [a54]: Nutrition opinion very negative

Comment [a55]: Gender dimension to nutrition

Comment [a56]: Social media as source of information about nutrition

Comment [a57]: Nutrition opinion very negative

Comment [a58]: Packaging/children as vulnerable consumers

Comment [a59]: children as vulnerable consumers

Comment [a60]: humour but

Comment [a61]: children as vulnerable consumers/lack of health awarness

Comment [a62]: screen time-lifestyle changes

Comment [a63]: SCHOOL FOOD MORE THAN A SNACK

Comment [a64]: breakfast